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The purposes of this study were to establish norms for the Indiana-Oregon Music Discrimination Test and to explore relationships between music discrimination and selected factors of environment, intelligence, and music experience and training. The test consists of phrases of concert-type music paired with versions of these same phrases in which one element--rhythm, melody, or harmony--has been altered. For the study, 4,412 subjects--American students in grades 5-12, British students in forms 1-6, college students (music and non-music majors), and an adult women's chorus--were given the test and asked to fill out an inventory of their music experience and training. When possible, information concerning I.Q., achievement-test scores, and school achievement was secured from school records. Analysis of the data suggested that piano experience, band/orchestra experience, and school achievement are related to music discrimination and that school music programs which are performan3e-oriented help to develop the musical tastes of youth. (Charts are included which present norms for the test and the correlation coefficients computed between music discrimination as measured by the Indiana-Oregon test and various factors of environment, music experience, and training.) (JS)

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ESTABLISHMENT OF STANDARDS FOR THE INDIANA-OREGON MUSIC DISCRIMINATION TEST BASED ON A CROSS-SECTION OF ELEMENTARY AND SECONDARY STUDENTS WITH AN ANALYSIS OF ELEMENTS OF ENVIRONMENT, INTELLIGENCE AND MUSICAL EXPERIENCE AND TRAINING IN RELATION TO MUSIC DISCRIMINATION

December 1967

Revised January 1969

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Office of Education
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Bloomington, Indiana

December 1967

Revised January 1969

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U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

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PREFACE

Little is known about musical taste and how it develops. Psychometric studies in music have centered on the measurement of music aptitude with the principal objective of identifying potential performers. There has also been some measurement of the influence of various kinds of music on rate of respiration, on heart beat, and upon the electrical impulses emitted by the brain; but in the area of measuring music appreciation or any aspects of it very little has been attempted.

The Oregon Test of Music Discrimination, developed in the 1930's by Kate Hevner, was the pioneer and sole major effort in measuring music appreciation, but her test was no longer available after recording companies shifted to the production of Long-Playing discs. With the permission and assistance of Dr. Kate Hevner Mueller, the author revised and updated the Oregon Test in 1964-65. The revised test, the Indiana-Oregon Music Discrimination Test, while available for this and other research purposes, was in need of standardization. One part of the problem, therefore, was to secure norms to help future users of the test interpret scores made by various age groups.

The other objective was to discover relationships between music discrimination, as measured by the Indiana-Oregon Test, and various aspects of environment and training. It was hoped that statistical analysis of the various interrelationships would reveal which types of experiences are most likely to positively influence the development of music discrimination, thus giving music educators some much-needed direction in planning the experiences that may lead to more discriminative music listening and a stronger intellectual understanding of music. These are objectives which have been given heavy emphasis in "Music in General Education," a 1966 publication of the Music Educators National Conference.

The author is deeply grateful to Indiana University for the sabbatical leave which permitted him to engage in the extensive program of testing herein reported. He also wishes to sincerely thank the administrators, teachers, and students who cooperated so wholeheartedly and cheerfully in the production and gathering of data. A list of the schools and colleges, with the names of assisting personnel, may be found in Appendix B, pages 74 to 76.

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SUMMARY

The purposes of this study were two: (1) to establish norms for the Indiana-Oregon Music Discrimination Test (a recent revision of the Oregon Test); and (2) to explore relationships between music discrimination as measured by the Test, and selected factors of environment, intelligence, and music experience and training.

The Indiana-Oregon Music Discrimination Test consists of phrases of concert-type music paired with mutilated versions of these same phrases in which one element, either the rhythm, melody, or harmony, has been altered. Sometimes the tape presents the correct version first, sometimes the spoiled version first, sometimes identical versions. Subjects respond by marking whether the correct version is "A" (first) or "B" (second) or "No" (no difference between A and B). They also mark whether it was the rhythm (R), the harmony (H), or the melody (M) that was altered. Scores for the test are obtained by adding the number of correct R-H-M responses to the number of correct A-B-No responses. In the process of test revision by the author in 1965, reliability coefficients of 0.729 for college students, 0.607 for junior high students, and 0.383 for fifth grade students were obtained by the split-halves method. More recently on a test-retest the coefficient of reliability obtained was 0.903 by rank-order correlation for a group of college students.

During February, March, and June, 1967, 3,136 students in Michigan, Indiana, Illinois, Arkansas, Oklahoma, Texas, Louisiana, Alabama, Tennessee, and Virginia were given the Indiana Oregon Music Discrimination Test and asked to fill out an inventory of their music experience and training. In May an additional 1,276 students were tested in England, Wales, and Scotland. The population tested included students in grades 5 through 12 (forms 1 through 6 in Great Britain), college students (both music majors and non-music majors) and an adult women's chorus. Information concerning I.Q., SAT scores, and school achievement were secured from school records whenever practical.

After the test scores and data from the inventory and from school records were coded and transferred to IBM punch cards, analysis was made with the aid of Indiana University Research and Computing Center's Control Data 3600-3400 System. Since not all subjects were given the same number of test items, the data and results were kept separate for three populations: E-30 - subjects responding to 30-item test (mostly upper elementary and junior high school pupils); J-37 - subjects responding to 37 items (mostly sixth grade and junior high, but including some senior high school students); and S-43 - subjects taking the complete 43-item test.

Norms for the Test

The mean scores, standard deviations, and number in each age group are presented in Tables S-1 thru S-4 on the following pages.

I believe you will find, upon comparing the December 1967 report with this revised one, that the contamination of findings by the British data was minimal. However, I think you were probably wise to have me compute the U S A data separately.

TABLE S-1 - MEAN SCORES, STANDARD DEVIATIONS AND NUMBER OF SUBJECTS BY AGES FOR ALL SUBJECTS

Age	10	11	11	12	12	12	13	13	13	14	14	15-16	15-16	17-18	19-21	22-25	26---
Number of test items	30	30	37	30	37	43	30	37	43	37	43	37	43	43	43	43	43
Mean score	23.1	24.3	27.5	25.2	33.9	34.1	27.3	34.8	38.4	35.3	40.7	35.2	42.1	46.4	51.3	54.0	54.7
S. D.	5.4	6.2	7.1	6.5	7.6	8.6	6.7	8.0	9.7	7.7	8.7	7.8	9.6	10.6	10.7	12.0	12.6
Number	123	263	64	302	268	128	163	384	165	308	152	81	538	641	499	79	88

TABLE S-2 - MEAN SCORES, STANDARD DEVIATIONS AND NUMBER OF SUBJECTS BY AGE--U.S.A. SUBJECTS ONLY

Age	11	11	12	12	13	13	14	14	15-16	15-16	17-18	19-21	22-25	26+
Number of test items	37	43	37	43	37	43	37	43	37	43	43	43	43	43
Mean score	27.5	33.9	33.8	33.7	34.9	38.3	35.9	39.5	37.3	41.3	45.9	50.2	55.1	54.6
S. D.	7.4	7.9	7.8	8.6	8.0	9.8	7.7	8.5	7.5	9.7	10.9	10.4	11.8	13.2
Number	57	31	233	118	285	159	186	121	46	435	476	321	48	47

TABLE S-3. MEAN SCORES, STANDARD DEVIATIONS AND NUMBER OF SUBJECTS BY GRADE IN SCHOOL OR OTHER ACADEMIC CLASSIFICATION FOR ALL SUBJECTS

Grade (or Form)	5	6 (1)	6 (1)	7 (2)	7 (2)	7 (2)	8-9 (3-4)	8-9 (3-4)	8-9 (3-4)	10-12 (5-6)	10-12 (5-6)	College non-music majors	Graduate students non-music	College music majors	Graduate music majors
Number of test items	30	30	37	30	37	43	30	37	43	30	43	43	43	43	43
Mean score	22.7	24.1	30.1	27.3	34.2	34.2	28.3	35.7	41.2	33.6	43.4	47.8	47.5	58.0	66.3
S. D.	6.2	5.8	7.7	7.0	7.9	8.5	5.3	7.8	8.8	7.5	9.9	10.3	11.0	7.9	5.8
Number	127	443	124	265	489	170	56	70	329	70	882	500	38	272	35

TABLE S-4. MEAN SCORES, STANDARD DEVIATIONS AND NUMBER OF SUBJECTS BY GRADE IN SCHOOL OR OTHER ACADEMIC CLASSIFICATION--U.S.A. SUBJECTS ONLY

Grade	6	6	7	7	8-9	8-9	10-12	College non-music majors	Graduate students non-music	College music majors	Graduate music majors
Number of test items	37	43	37	43	37	43	43	43	43	43	43
Mean score	28.3	31.8	33.7	33.4	36.5	40.5	42.5	45.4	49.7	57.0	65.6
S. D.	6.8	7.3	7.8	7.9	7.8	9.0	9.9	9.5	10.9	7.6	5.7
Number	72	59	378	158	353	247	708	304	23	223	32

Correlations

Correlation coefficients computed between music discrimination as measured by the Indiana-Oregon Music Discrimination Test and various factors of music experience, music training and certain environmental factors are shown in Table S-5 on the following page.

Some interesting and statistically significant correlations discovered between various factors were these:

These coefficients are for the S-43 group (those taking the 43-item test), U.S.A. subjects only.

Self-evaluation of musicality with self-estimate of how well one can play	0.61
Self-evaluation of musicality with self-estimate of how well one can sing	0.50
Self-evaluation of musicality with frequency of attendance at concerts	0.41
Self-evaluation of musicality with piano experience	0.38
Self-evaluation of musicality with band/orchestra experience	0.37
Self-evaluation of musicality with choral experience	0.37
Self-evaluation of musicality with expressed preferences for concert type music	0.37
Total number of instruments in the home with numbers of others in the family who play instruments	0.50
Choral experience with voice lessons	0.52
Choral experience with piano experience	0.41
Choral experience with self-estimate of how well can sing	0.55
Choral experience with frequency of concert attendance	0.35
Choral experience with expressed preferences for concert type music	0.39
Band/orchestra experience with lessons on instruments other than piano	0.56
Band/orchestra experience with self-estimate of how well one can play an instrument	0.61
Band/orchestra experience with expressed preferences for concert type music	0.19
Piano experience with self-estimate of how well one can play	0.46
Piano experience with frequency of concert attendance	0.35
Piano experience with school achievement	0.33
Expressed preferences for concert music with frequency of concert attendance	0.46
SAT - Verbal scores with I.Q.	0.71
SAT - Verbal scores with SAT - Mathematical scores	0.66
SAT - Verbal scores with School achievement	0.46
SAT - Verbal scores with Socio-Economic indes	0.33

Girls were found to score higher than boys in secondary schools, but only 0.7 points on the average. Students whose homes had FM radios averaged 2.0 points higher on their music discrimination scores than did those with AM radios.

TABLE S-5. CORRELATIONS BETWEEN FACTORS STUDIED AND SCORES ON THE INDIANA-OREGON MUSIC DISCRIMINATION TEST FOR DIFFERENT TEST GROUPS

	Group E 30-item test	Group J 37-item test		Group S 43-item test	
	All	All	USA only	All	USA only
Age	.35	.18	.23	.46	.45
Grade in school	.39	.16	.22	.56	.58
Extent of piano lessons	.36	.34	.32	.56	.54
Extent of instrument lessons (other than piano)	.28	.15	.17	.33	.32
Number of additional instruments	.18	.14	.16	.28	.31
Band and/or orchestra experience	.24	.22	.27	.27	.32
Choral experience	.23	.13	.09*	.38	.35
Extent of voice lessons	-.07#	.12	.04#	.29	.34
Keyboard instruments in the home	.09	.25	.28	.31	.32
String instruments in the home	.15	.15	.15	.28	.24
Wind and percussion instruments in the home	.04#	.18	.27	.11	.20
Radios and record players in home	-.01#	.14	.16	.06	.19
Total number of instruments in home	.22	.35	.38	.37	.39
Number of others in family who play instruments	.14	.18	.23	.26	.26
Frequency of music making in home	.10	.10	.12	.15	.13
Self-estimate of how well can sing	.19	.19	.17	.37	.37
Self-estimate of how well can play	.20	.37	.39	.47	.50
Frequency of concert attendance	.08*	.14	.13	.38	.40
Self-evaluation of musicality	.18	.23	.24	.43	.46
Expressed preferences for concert type music	.18	.27	.28	.50	.56
Like to study with music playing	-.01#	.14	.07	-.23	-.22
Rural-Urban index	.14	-.21	-.30	.08	.11
Socio-Economic index	.18	.23	.30	.29	.33
Neatness in marking test forms	-.14	-.02#	-.06#	-.20	-.09
S A T - Verbal scores	.52	.23*	.22	.39	.39
S A T - Math scores	.23#	-.03#	-.03#	.26	.26
I. Q.	.38	.30	.30	.47	.48
School achievement	.28	.27	.29	.41	.41
A-B-No portion of Test	.88	.86	.87	.93	.93
R-H-M portion of Test	.87	.87	.88	.94	.94
Total number tested	964	1119	813	2329	1758

* significant at 5% level # not significant

A set of multiple correlations were computed by stepwise regression for 292 group S-43 U.S.A. subjects on whom there was complete data. Piano experience was shown to be the most closely related to music discrimination with a coefficient of 0.4262; with band/orchestra experience combined with piano experience the correlation rose to 0.5308; school achievement combined with the other two brought the correlation with music discrimination to 0.5782 and choral experience added brought the multiple correlation to 0.6087. Very small increments in correlation were brought about through addition of number of instruments in the home, Socio-Economic index, extent of voice lessons, number of others in family who play instruments, extent of lessons other than piano, and frequency of home music making.

There is evidence here that our performance oriented music programs in schools are making significant contributions to the musical taste of youth. The correlations of both music discrimination and expressed preferences for concert type music with choral experience and with band/orchestra experience are all significant, although not as large as their correlations with extent of piano lessons.

INTRODUCTION

Objectives

The objectives of this research were, first, to find what relationships exist between music discrimination, a cognitive aspect of music appreciation, and various elements of environment, such as rural-urban and socio-economic level, between music discrimination and age, sex, and extent and kind of music experience and training, and between music discrimination and music aptitude, general intelligence, school achievement, and music preferences.

A second objective was to establish norms for the Indiana-Oregon Music Discrimination Test.

The objectives of this project were also expressed in terms of hypotheses to be tested:

(a) There is no significant difference between males and females in their ability to make music discriminations.

(b) There is no significant difference between urban and rural populations in their ability to make music discriminations.

(c) There is no significant difference between persons who enjoy high socio-economic status and those who have only low socio-economic level in their ability to make music discriminations.

(d) There is a significant difference between those who have learned to play music instruments and those who have not in their ability to make music discriminations.

(e) If hypothesis (d) is substantiated, which instruments studied are most likely to enhance music discrimination?

(f) People who begin private music study at an early age are most likely to excell in music discrimination.

(g) There is a positive relationship between concert attendance and music discrimination ability.

(h) Persons whose homes have F-M radios in them are apt to have higher scores in music discrimination.

(i) The relationship between music discrimination and intelligence is low but positive.

(j) The relationship between music discrimination and school achievement is also low and positive.

(k) If one or both parents play an instrument or sing, the subject will score better in music discrimination.

(l) Subjects who express a preference for "serious" music will score higher in music discrimination.

From the testing of these hypotheses it was hoped that the author would be able to develop a list of school music activities which are likely to aid the development of music discrimination.

In addition to supplying norms for the Indiana-Oregon Music Discrimination Test, this investigation was expected to indicate ways in which the test might be used to strengthen music learning.

Related Literature

During the 1940's and 1950's interest and activity in music testing was surprisingly slight. Colwell[1] accounts for this lack of activity by speculating that mental and personality characteristics of musicians are not compatible with the tasks of gathering and processing data, that artist musicians deem their art more important than any objective, tangible, hence measurable, values therein, and that music teachers are fearful pupils' enjoyment of music might be dampened by anxieties of testing situations. He conceded that tests of music aptitude, though the most widely used of any music tests, are still controversial, but he argued that the disappointing predictive precision of music aptitude tests was not reason for shunning other areas of music testing, contending that, unless we find out more accurately what music learning is taking place, our attempts to improve music programs will be based on mere calculated guesses. Colwell mentions only two tests of music appreciation, the Drake Test of Music Memory, primarily a music aptitude test which attempts to measure only a single, simple listening skill, and the Oregon Music Discrimination Test, which he found was more inclusive. (It is because this Oregon Test has been unavailable for nearly twenty years, the need to conduct investigations with the new Indiana revision was urgent.)

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[1] Colwell, Richard, "Evaluation: Its Use and Significance," Music Educators Journal, 49:45-49, February-March, 1963.

The numerous studies of music aptitude are peripheral to this project, but studies dealing with music taste or preferences have a closer relationship. Rogers[2] found that among school children preference for popular music increased with age, regardless of sex or socioeconomic level and that with increasing age, children exhibited a tendency to conform to a single pattern of preference. He found the influence of the socio-economic factor not strong, but detected a small preference for "classical music" in the upper-class group.

Fulbright[3] found that college women had a more favorable attitude toward classical music than did college men and that the differences were greater when the attitudes tended to be more favorable. He also found that both pre-college and college training in music correlated positively with favorable attitudes toward classical music. He found a positive correlation between favorable attitudes and college class, academic achievement and familiarity with the examples heard; he found no significant relationship between attitudes toward classical music and occupation of father, family income, or academic achievement.

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[2] Rogers, Vincent Robert, "Children's Expressed Music Preferences at Selected Grade Levels," Ed.D. dissertation, Syracuse University, 1956, (DA XVI, 10, 1917).

[3] Fulbright, Ercy Glenn, "An Investigation of Relationships Between Cultural Background and Attitude Toward Classical Music Among College Undergraduates," unpublished doctoral dissertation, Indiana University, 1964.

Baumann[4] investigated the music preferences of 1600 Teenagers in Phoenix, Arizona, and Cumberland, Maryland, by having students check a 3-point scale--"like most," "like," "like least"--on hearing 50 taped portions of 20 popular, 20 "classical," and 10 traditional pieces. By retest, he obtained a reliability coefficient of 0.87. Social-economic status was determined by using an inventory containing 25 true-false items. Differences noted were that low status pupils tended to prefer traditional music, to listen more to juke boxes and radio, whereas, the high status group was more likely to prefer classical music than was the low status group, and it was more likely to listen to phonographs. Popular music was favored by all age groups, but it diminished in favor with the older groups. Baumann suggested further research might show it would be better to present Bartok or Stravinsky than Haydn or Mozart at certain age levels.

Schuessler[5] concluded that taste (preference) in music depends on sex, age, social class, and how much music of each kind has been heard. His study of a cross section of the population of Evansville, Indiana, showed women's tastes in music to be more catholic than men's, hill-billy music to be the only kind more preferred by men than by women, and wealthy persons mor apt to enjoy classical music.

A less sociologically oriented study of the correlations between age, intelligence, and music training, and reactions to music was made by Rubin-Rabson[6] whose subjects were adults, aged 20 to 70. These subjects reacted to 24 pieces of music, marking their reactions on a 5-point scale. The most significant correlation obtained was between age of subjects and indifference to classical or modern music. Training seemed to influence taste only in regard to modern music. Intelligence was found to be higher among those indifferent to modern music. Rubin-Rabson's study overlooked the possibility that other components in the examples might have affected reactions to the music more than those components which justified the music's classification by periods.

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[4] Baumann, Victor High, "Socioeconomic Status and the Music Preferences of Teen-Agers," Journal of Research in Music Education, VIII, Fall 1960, 75-82.

[5] Schuessler, K. F., "Musical Taste Tested," Science News Letter, 55:397, June 19, 1948.

[6] Rubin-Rabson, G., "The Influence of Age, Intelligence and Training on Reaction to Classical and Modern Music," Journal of General Psychology, 22:413-429, 1940.

An experiment to discover the relationship between aesthetic sensitivity and each of three traits, musical ability, intelligence, and socio-economic status, when the other two traits were held constant, was conducted by Parker[7] using 1174 Kansas high school students. To measure aesthetic sensitivity he used Wing's Test of Music Appreciation, which is a part of Wing's battery for measuring music aptitude. While this music appreciation test is similar in some respects to the Indiana-Oregon Music Discrimination Test, it is too short to give a dependable indication of music discrimination and/or aesthetic sensitivity. The highest coefficient of correlation obtained by Parker (0.420) was between aesthetic sensitivity and music ability in girls; the corresponding r for boys was 0.296. Between intelligence and aesthetic sensitivity the relationship was low, 0.134 for boys, 0.054 for girls. Parker found no significant relationship between aesthetic sensitivity and socio-economic status among Kansas youths.

Heller[8] found a low, positive correlation between scores on the Wing Test of Musical Intelligence battery and measures of general scholarship.

Boekelheide[9] developed her own tests of rhythmic response, melodic contour, pitch discrimination, phrase discrimination and form for her investigation of 300 eight and nine year olds in Sacramento, California. She concluded that: these children had a wide range of listening skills; children of this age with high achievement in reading and other subjects have acquired basic listening skills; teachers' judgments of over-all music ability are too dependent on ratings of singing ability; some high achievers on music tests, especially boys, have a negative attitude toward music; and the inter-correlations of the five tests indicated each one tested some basic music listening skill not measured by the others. She felt that music listening tests merit further exploration and refinement. (Underlining by author of this report.)

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[7] Parker, O. G., "A Study of the Relationship of Aesthetic Sensitivity to Musical Ability, Intelligence and Socioeconomic Status," Ed.D. dissertation, University of Kansas, 1961, 168pp. (DA XXII, 7,2416).

[8] Heller, Jack Joseph, "The Effects of Formal Musical Training on the Wing Musical Intelligence Score," Ph.D. dissertation, State University of Iowa, 1962. (DA XXIII, 8,2936).

[9] Boekelheide, Viola Ethel, "Some Techniques of Assessing Certain Basic Music Listening Skills of Eight and Nine Year Olds," Ed.D. dissertation, Stanford University, 1960, 247 pp. (DA XXI, 10 3111).

Erneston[10] made an exploratory study of acquired musical taste in relation to music experience and mental ability. For his study of 780 freshmen at Appalachian State Teachers College he defined, operationally, musical preference, and music discrimination. (The Dissertation Abstract does not mention how music discrimination was measured.) Erneston found strong relationship between music experience and acquired musical taste, but no evidence linking any particular type of music activity with a higher level of acquired taste. Length of time spent in music participation and high mental ability did prove to be factors positively related to taste formations. In the group with no formal music experience there was no significant difference between scores on "total taste" and intelligence.

Comparing five music-participating students with five non-music-participating students in each high school class (grade), Stewart[11] found significant differences, with the music-participating students excelling in musical knowledge, visual and aural imagery, interest in music, musical activity and interest in the home, memorable music experiences, and non-verbal performance skills.

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[10] Erneston, Nicholas, "A Study to Determine the Effect of Music Experience and Mental Ability on the Formation of Musical Taste," Ph.D. dissertation, The Florida State University, 1961.

[11] Stewart, John W., "Influence of Public School Music Education as Revealed by a Comparison of Forty Selected High School Music and Non-Music Students," Ed.D. dissertation, The Florida State University, 1961, 91 pp. (DA XXII, 8, 2822).

Interest in anticipated post-high school music making decreased with added high school music experience. He found no significant differences between the two groups in regard to music preferences, emotional responses, attitude toward the appropriateness of school music, opinions regarding the purposes of school music, incidence of private study in music or the incidence of formal music activities other than private lessons and school music.

When factor analysis was employed by Hornyak[12] he showed that it was an effective tool in revealing significance of relationships between components of music and value judgments about the music by individuals and groups. He demonstrated that the relationship between certain components are bi-polar since the presence of a particular component can lead to both negative and positive responses. He also showed that melody, tonal or triadic harmonies, orchestral color, solo voice color, and choral color provide bases for value judgments by college students. His study suggested that music appreciation need not start with 19th Century musical examples, and it showed that accented rhythms and propulsive rhythms provide bases for value judgments, whereas meter and tempo do not. He concluded that factor analysis can provide the basis for general understanding of what students are able to perceive in music.

Lease[13] looked for significant relationships between scores on the Seashore measure for pitch, rhythm, and tonal memory, on the Drake Test of Musical Memory, on the Kwalwasser-Ruch Test of Music Accomplishment, and on school and college ability tests. His subjects, each with three years experience in high school chorus or band, were 150 vocal and 105 instrumental students from seven South Dakota high schools. Significant differences, with instrumentalists having the higher means, were found for the following measures: SCAT Qualitative, Seashore Pitch, Seashore Tonal Memory, K-D Rhythm, K-D Tonal Memory, Drake Music Memory, and Kwalwasser-Ruch achievement. No significant differences were found for: SCAT Verbal, SCAT Total, Seashore Rhythm, and K-D Pitch. String players excelled on the K-D Rhythm, but there was no significant difference between string, woodwind, brass, or percussion players on the other tests. Lease found a low, positive correlation between music aptitude and intelligence.

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[12] Hornyak, R. Robert, "A Factor Analysis of the Relationship between the Components of Music Present in Selected Music Examples and the Preference Rating Responses of College Students to the Selected Musical Examples," doctoral dissertation, Indiana University, 1964.

[13] Lease, Gus C., "A Study of the Musicality, Intelligence, and Musical Achievement of Vocalists and Instrumentalists in Selected High Schools," Ed.D. dissertation, State University of South Dakota, 1959, 165 pp. (SA XX, 9, 3631).

For the most part the studies reported above have dealt with music preferences or attitudes toward music and how these relate to music aptitude, music training and experience, intelligence and elements of environment. The possibility and need to study them as they relate to music discrimination were present and urgent.

The completion in 1965 of a revision of the Oregon Music Discrimination Test by the author[14] provided an acceptable means of measuring certain abilities to make judgments about music; the revised test, the Indiana-Oregon Music Discrimination Test, became the basic research tool for the project at hand.

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[14] Long, Newell H., A Revision of the University of Oregon Music Discrimination Test, Ed.D. dissertation, Indiana University, 1965.

PROCEDURE

The procedure followed was simply to : (1) administer the Indiana-Oregon Music Discrimination Test to various populations which together would represent a wide spectrum of ages, grades in school, music training, music experience, geographic location, community size, and socio-economic background; (2) collect data on the subjects tested from the responses on the inventory on the back of the test answer form--see Appendix A, page 70; (3) secure from school records information concerning I.Q., SAT scores, and school achievement; (4) code the information and punch it on IBM cards; and (5) analyze the data with the aid of Indiana University's Control Data 3600/3400 System.

The Indiana-Oregon Music Discrimination Test consists of 43 items, each of which presents on tape two versions of a phrase from an accepted piece of concert-type music. One version, the correct one, is the way it was written by an artist composer; the other is a mutilated version in which one of the elements, rhythm, melody, or harmony, has been altered. On the recording the correct version is sometimes presented first, sometimes second, and in a few instances both versions are identical. The subject responds by marking whether he thinks the first, A, version or the second, B, version is the correct one or whether he hears no difference; and he marks which element he thinks was changed, R (for Rhythm), M (for Melody), or H (for Harmony). The test is scored by adding the number of correct A-B-No responses to the number of correct R-H-M responses.

Because 43 test items appeared unduly fatiguing to elementary and junior high school pupils, only 37 items were used with classes consisting principally of junior high students. For still younger pupils, only 30 test items were presented. To determine the loss in reliability resulting from shortening the test, a rank-order correlation was computed of the scores made by 74 students on all 43 test items with their scores on only the first 30 items. The coefficient of correlation obtained was .968, indicating that scores from the first 30 items could be used with confidence that any loss of reliability was small.

Since some classes were tested with 30 items, some with 37, and others with 43, these populations will be differentiated as follows in the ensuing report:

Group E-30	Those subjects responding to the 30-item test (mostly upper-elementary pupils)

Group J-37 Those subjects responding to the 37-item test (mostly junior high pupils)

Group S-40 Those subjects responding to the complete 43-item test (mostly senior high school and college students)

Description of the Population Tested

The distribution of these three groups by ages is shown in Table I, by grade in school in Table II.

TABLE I. DISTRIBUTION BY AGES

All Subjects

Age	Group E-30 Number	%	Group J-37 Number	%	Group S-43 Number	%	Total Number	%
10	123	12.9	6	0.5			129	2.9
11	263	27.5	64	5.7	32	1.3	359	8.1
12	302	31.5	268	24.1	128	5.4	698	15.9
13	163	17.0	384	34.3	165	7.0	712	16.2
14	26	2.7	308	27.6	152	6.4	486	11.1
15-16	55	5.7	81	7.2	538	24.0	674	15.3
17-18	25	2.6	7	0.6	641	27.4	673	15.3
19-21	1	0.1			500	21.3	501	11.4
22-25					78	3.4	78	1.8
26 +					88	3.8	88	2.0
Total	958	100.0	1118	100.0	2322	100.0	4398	100.0

U.S.A. Subjects

Age	Group J-37 Number	%	Group S-43 Number	%
10	5	0.6	0	0.0
11	57	7.0	31	1.8
12	233	28.7	118	6.7
13	285	35.1	159	9.1
14	186	22.9	121	6.9
15-16	46	5.7	435	24.8
17-18	1	0.1	476	27.1
19-21			321	18.3
22-25			47	2.7
26 +			47	2.7
Total	813	100.0	1755	100.0

TABLE II. DISTRIBUTION BY GRADE IN SCHOOL

	All Subjects								U.S.A. Subjects			
Grade	Group E-30		Group J-37		Group S-43		Total		Group J-37		Group S-43	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
5	127	13.1					127	2.8	0	0.0	1	0.1
6 (1)*	443	46.0	124	11.2	70	3.0	633	14.5	72	8.9	59	3.4
7 (2)*	269	27.9	489	44.4	170	7.3	928	21.3	378	46.6	158	9.0
8-9 (3-4)*	56	5.8	492	44.7	329	14.2	877	20.0	353	43.5	247	14.1
10-12 (5-6)*	70	7.2	8	0.7	882	38.5	960	21.9	6	0.7	708	40.4
Noncollege adults					17	0.7	17	0.4	0	0.0	0	0.0
College undergraduates (non-music majors)					500	21.5	500	11.2	0	0.0	304	17.3
Graduate students (non-music)					38	1.6	38	0.9	1	0.1	23	1.3
Music majors (undergraduates)					272	11.7	272	6.2	2	0.2	223	12.7
Music majors (graduate)					35	1.5	35	0.8	0	0.0	31	1.8
Total	961	100.0	1113	100.0	2313	100.0	4387	100.0	812	100.0	1754	100.0

* Numbers in parentheses refer to the forms in British schools.

A complete list of schools and colleges which provide subjects for this study may be found in Appendix B on page 74. The geographical distribution of the subjects is shown in Table III.

TABLE III. GEOGRAPHICAL DISTRIBUTION OF SUBJECTS

Area	Group E-30	Group J-37	Group S-43	Total
Alabama and Louisiana		30	296	326
Oklahoma, Arkansas and north Texas	142	128	398	668
Virginia and Tennessee		241	33	274
Indiana and Illinois	295	231	919	1445
Michigan	134	182	107	423
U.S.A. Total	571	812	1753	3136
England	161	127	363	651
Wales	176	59	71	306
Scotland	57	121	141	319
Overall Total	965	1119	2328	4412

The communities from which the subjects came were classified into catagories which roughly indicated the rural-urban character of the subject's environment during childhood and youth. The distribution of subjects on this basis is shown in Table IV.

The index of socio-economic level of the homes from which subjects came was determined principally from the occupation listed for the parent or parents. The scales worked out by Warner, Meeker and Eels[15] and by Cole[16] were used as guides in determining each index. Table V gives the frequency of socio-economic indices for each of the test groups.

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[15] Warner, Lloyd, Meeker, Marica, and Eels, Kenneth, Social Class in American, Science Research Associates, Chicago, 1949, p. 141.

[16] Cole, G. D. H., Studies in Class Structure, Routledge and Kegan, Paul, London, E.C. 4, 1955, pp. 160-161.

TABLE IV. CLASSIFICATION OF SUBJECTS BY SIZE OF COMMUNITY

	All Subjects								U.S.A. Subjects			
Rural-Urban Classification	Group E-30		Group J-37		Group S-43		Total		Group J-37		Group S-43	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Rural	4	0.4	36	3.2	145	7.2	185	4.6	29	3.6	108	7.1
Semi-rural; small village	37	4.1	9	0.8	108	5.4	154	3.8	9	1.1	42	2.8
Small town	75	8.1	209	18.8	451	22.4	735	18.1	161	19.9	378	24.8
Medium sized town or city	243	26.1	242	21.6	562	28.1	1047	25.9	162	20.0	480	31.5
Large town or city	122	13.2	294	26.2	143	7.1	559	13.8	206	25.4	119	7.8
Suburban	80	8.5	135	12.3	271	13.5	486	11.9	52	6.3	131	8.6
Urban; metropolitan	364	39.1	194	17.1	325	16.3	883	21.9	194	23.7	265	17.4
Total	925	100.0	1119	100.0	2008	100.0	4049	100.0	813	100.0	1523	100.0

TABLE V. DISTRIBUTION OF SUBJECTS BY SOCIO-ECONOMIC INDEX

	All Subjects								U.S.A. Subjects			
Socio-Economic Index with Representative Occupation	Group E-30 Number	%	Group J-37 Number	%	Group S-43 Number	%	Total Number	%	Group J-37 Number	%	Group S-43 Number	%
1 - Migrant	34	4.9	31	3.2	51	2.8	116	3.3	0	0.0	0	0.0
2 - Unskilled	34	4.9	31	3.2	51	2.8	116	3.3	24	3.6	42	3.2
3 - Medium skilled clerks	121	15.9	139	14.4	170	9.4	430	12.2	88	13.2	119	9.2
4 - Skilled, carpenters	216	28.6	292	30.2	379	20.8	887	25.1	200	29.8	295	22.8
5 - Foremen, salesmen	198	26.2	250	26.0	458	25.2	906	25.6	167	25.1	326	25.2
6 - Teachers, assistant managers	56	7.5	68	7.0	199	11.0	323	9.1	47	7.1	116	9.0
7 - Insurance agent, small business	65	8.1	91	9.9	286	15.7	442	12.5	64	9.6	205	15.9
8 - Managers, contractors	45	5.9	63	6.5	178	9.8	286	8.1	55	8.2	118	9.1
9 - Lawyers, Surgeons	22	2.9	26	2.7	94	5.1	142	4.0	23	3.4	69	5.4
10 - Industrialists, large business			1	0.1	3	0.2	4	0.1	0	0.0	3	0.2
Total	757	100.0	961	100.0	1818	100.0	3536	100.0	669	100.0	1293	100.0

A tabulation of the years of piano study the subjects claimed to have had is shown in Table VI.

TABLE VI. DISTRIBUTION OF SUBJECTS BY YEARS OF PIANO STUDY

	All Subjects				U.S.A. Subjects	
Years of Piano Study	Group E-30	Group J-37	Group S-43	Total	Group J-37	Group S-43
None	443	480	970	1893	302	743
1	69	70	195	334	53	145
2	48	64	168	280	48	124
3	36	64	122	222	58	94
4	16	48	125	189	39	88
5	14	29	106	149	21	73
6	5	22	81	108	17	54
7-8	7	18	103	128	9	63
9-11	5	2	99	106	1	67
12 or more			82	82	0	51
Mean years of piano study for those responding	0.81	1.26	2.27	1.94	1.39	2.32

Musical instruments, other than piano, studied by the subjects were indicated with the following frequencies:

TABLE VII. NUMBER OF SUBJECTS WHO HAD STUDIED OTHER INSTRUMENTS

Instruments studied	Group E-30	Group J-37	Group S-43	Total
None	289	263	759	1311
Organ or accordion	19	21	110	150
String instrument	43	43	161	247
Woodwind	56	125	275	456
Brass	22	88	163	273
Percussion	16	33	51	100
Plectrum (guitar, banjo)	24	60	68	152
Miscellaneous	1	5	9	15
Two instruments			2	2
Three or more			1	1
Total reporting	470	638	1599	2707

The subjects who indicated they had studied instruments other than piano are classified in Table VIII according to the number of years of such study.

TABLE VIII. YEARS OF STUDY ON INSTRUMENTS OTHER THAN PIANO

Years of study	Group E-30	Group J-37	Group S-43	Total
None	314	310	822	1446
1	94	135	245	474
2	40	92	170	302
3	6	53	83	142
4	8	24	76	108
5		10	71	81
6	4	8	59	71
7 or 8	1	6	44	51
9 to 11	3		25	28
12 or more			4	4
Total reporting	470	638	1599	2707
Mean number of years of study for those responding	0.83	0.95	1.49	

The 324 persons who reported that they had had private voice lessons are distributed according to the years of voice instruction in Table IX.

TABLE IX. DISTRIBUTION BY YEARS OF VOICE STUDY

	All Subjects				U.S.A. Subjects	
Years of private voice lessons	Group E-30	Group J-37	Group S-43	Total	Group J-37	Group S-43
None	426	509	1355	2290	323	931
1	12	15	119	146	15	108
2	8	11	56	75	9	50
3	2	3	33	38	2	24
4	1		24	25	0	18
5		2	18	20	1	15
6		1	7	8	0	6
7-8			5	5	0	4
9-11			5	5	0	3
12 or more			2	2	0	0
Total number reporting	449	541	1624	2614	350	1159

The years of experience in orchestras and bands were not coded on a linear basis, but on a scheme which assumed that there was a diminishing return in successive years of such experience or in concurrent experience in more than one performing group. For experience in the school or community band or orchestra in which the subject indicated the longest period of participation, one point was allowed for one year, two points for two or three years, three for four, five or six years, and four points for seven or more years. Additional points for experience in another band or orchestra were on the basis of one point for one or two years, two points for three to five years, and three points for six or more years. Experience in a third group was scored the same as experience in the second one. Table X shows the distribution of years of band and/or orchestra experience as so coded.

TABLE X. EXTENT OF BAND AND/OR ORCHESTRA EXPERIENCE

		All Subjects				U.S.A. Subjects	
Code	Minimum years of band-orchestra experience represented	Group E-30	Group J-37	Group S-43	Total	Group J-37	Group S-43
0	None	359	297	873	1529	131	533
1	1	105	104	124	333	80	92
2	2	103	276	188	567	256	145
3	3	13	139	332	484	123	296
4	4	3	6	186	195	2	170
5	6	1		67	68	0	56
6	8		2	37	39	1	33
7	11			24	24	0	23
8	13			1	1	0	1
9	16			4	4	0	4
Total reporting		584	824	1836	3244	593	1353
Mean period of band/orchestra experience as coded -- years		0.62	1.35	1.64		1.67	1.96

Years of choral experience reported was similarly coded although church choir experience was discounted 30% to 50% on the assumption that such experience was likely to be less frequent and less regular than school choral experience. The distribution is shown in Table XI.

TABLE XI. EXTENT OF CHORAL EXPERIENCE

		All Subjects				U.S.A. Subjects	
Code	Minimum years of choral experience	Group E-30	Group J-37	Group S-43	Total	Group J-37	Group S-43
0	None	226	220	455	901	132	278
1	1	184	217	333	734	179	283
2	2	161	230	387	778	164	315
3	3	64	120	355	539	83	268
4	4	18	36	229	283	20	162
5	6	5	6	146	157	3	107
6	8	1	2	71	74	0	50
7	11	1		42	43	0	28
8	13	1		5	6	0	3
9	16			8	8	0	5
Total reporting		661	831	2031	3523	581	1499
Mean years of choral experience (as coded) for those responding on this item		1.23	1.47	2.29		1.47	2.31

Subjects taking the test were asked to check whether they were presently members of their school or college band, orchestra or chorus. The responses are categorized in Table XII.

TABLE XII. PRESENT MEMBERSHIP IN BAND, ORCHESTRA OR CHORUS

	All Subjects				U.S.A. Subjects	
Member of	Group E-30	Group J-37	Group S-43	Total	Group J-37	Group S-43
None	413	330	989	1732	165	678
School Chorus	219	216	602	1037	146	457
School Band	94	358	364	816	346	363
School Orchestra	58	68	58	184	49	31
Chorus and Band	12	22	89	123	22	88
Chorus and Orchestra	20	23	47	90	7	7
Band and Orchestra	4	18	47	69	15	45
Band, Orchestra and Chorus	4	5	13	22	4	8
Total number in						
Choruses	255	266	751	1272	179	560
Bands	114	403	513	1030	387	504
Orchestras	86	114	165	365	75	91
Total number reporting	824	1040	2209	4073	754	1677

The subjects were also asked to indicate which keyboard instruments were in their home. The frequency with which the names of keyboard instruments were checked is shown in Table XIII.

TABLE XIII. NUMBER HAVING KEYBOARD INSTRUMENTS IN THEIR HOMES

	All Subjects				U.S.A. Subjects	
Instrument(s) present in home	Group E-30	Group J-37	Group S-43	Total	Group J-37	Group S-43
None	486	569	940	1995	380	721
Accordion	18	16	44	78	8	31
Piano	261	355	1031	1647	269	717
Organ	54	69	119	242	65	114
Accordion and Piano	18	39	66	123	25	48
Accordion and Organ	2	6	14	22	6	13
Piano and Organ	24	34	71	129	34	71
All three	3	4	14	21	2	13
Total number reporting	866	1092	2299	4257	789	1728

The distribution of those reporting the presence of string instruments in their homes is presented in Table XIV.

TABLE XIVA. NUMBER HAVING STRING INSTRUMENTS IN THEIR HOMES

	All Subjects				U.S.A. Subjects	
String instruments present in home	Group E-30	Group J-37	Group S-43	Total	Group J-37	Group S-43
None	527	650	1306	2483	454	1008
Guitar or banjo	210	305	614	1129	240	500
Violin or viola	68	68	157	293	44	83
Cello or bass	9	8	18	35	4	12
Guitar and violin	45	45	137	227	35	86
Guitar and cello	3	6	28	37	5	20
Violin and cello	5	3	17	25	3	9
Violin, cello and guitar	2	7	18	27	5	7
Total number having						
Guitar or banjo	260	363	797	1420	285	613
Violin or viola	120	123	329	572	87	185
Cello or bass	19	24	81	124	17	48
Total number reporting	869	1092	2295	4256	790	1725

The number of persons indicating that wind instruments or percussion instruments were in their homes is shown by Table XIV.

TABLE XIVB. NUMBER WHOSE HOMES HAVE WIND OR PERCUSSION INSTRUMENTS

	All Subjects				U.S.A. Subjects	
Wind or percussion instruments	Group E-30	Group J-37	Group S-43	Total	Group J-37	Group S-43
None	603	586	1290	2479	337	832
Flute	43	53	98	194	48	80
Clarinet	40	79	168	287	69	140
Oboe or bassoon	3	2	17	22	1	8
Saxophone	10	24	47	81	23	46
Trumpet or cornet	34	87	142	263	76	137
Trombone or baritone	11	28	54	93	26	46
Percussion	54	66	106	226	52	91
Any two winds or percussion	55	123	261	439	117	242
Any three or more	14	41	104	159	40	100
Total number reporting	867	1089	2287	4243	789	1722

The number of persons who reported their homes had radios or record players is set forth in Table XV. Since there are few FM radios in Great Britain, where BBC's "Third Program" tends to take the role of U.S.A. FM stations in presenting concert music, the British students were instructed to ignore item 21 of the Inventory; consequently, the proportion of U.S. homes having FM radios is higher than a study of the table might suggest.

TABLE XV. PRESENCE OF RADIOS AND RECORD PLAYERS IN HOMES

	All Subjects				U.S.A. Subjects	
Radios and Record Players	Group E-30	Group J-37	Group S-43	Total	Group J-37	Group S-43
None	12	12	18	42	2	11
AM Radio	78	74	112	264	25	58
FM Radio	14	15	27	56	14	26
Record player	31	22	31	84	16	22
AM and FM radios	30	31	77	138	31	70
AM radio and record player	394	415	748	155	180	342
FM radio and record player	28	30	91	149	30	87
Record player and both AM and FM	260	463	1153	1876	462	1075
Total number of homes						
with AM radio	762	983	2090	3835	698	1545
with FM radio	332	539	1348	2219	537	1258
with record player	713	930	2023	3666	688	1526
Total number reporting	847	1062	2257	4166	760	1691

The total number of instruments in the subject's home was obtained by adding the number of keyboard, string, wind, and electronic instruments that had been checked. The distribution of these totals is given in Table XVI.

To obtain an index of the extent to which members of a subject's immediate family, other than himself, were performers on music instruments an arbitrary scale was used. The frequency with which each scale step was reached is shown in Table XVII.

TABLE XVI. TOTAL NUMBER OF INSTRUMENTS IN THE HOME

	All Subjects								U.S.A. Subjects			
Number of Instruments	Group E-30		Group J-37		Group S-43		Total		Group J-37		Group S-43	
	f	%	f	%	f	%	f	%	f	%	f	%
None	5	0.6	4	0.4	9	0.4	18	0.4	4	0.5	8	0.5
1	81	9.2	68	6.2	99	4.2	248	5.8	48	6.1	80	4.6
2	224	25.7	230	21.0	417	18.1	871	20.4	133	16.8	295	17.0-
3	240	27.4	288	26.3	560	24.2	1088	25.5	190	24.0	409	23.7
4	171	19.5	277	20.7	507	22.3	905	21.3	176	22.2	391	22.6
5	88	10.0	146	13.3	367	16.1	601	14.1	125	15.7	297	17.1
6	40	4.6	78	7.1	194	8.6	312	7.3	69	8.7	145	8.3-
7	16	1.8	29	2.6	74	3.2	119	2.7	27	3.4	55	3.2
8	5	0.6	11	1.1	38	1.6	54	1.3	10	1.2	24	1.4
9 or more	5	0.6	14	1.3	31	1.3	50	1.2	11	1.4	27	1.6
Total number reporting	875	100.0	1095	100.0	2296	100.0	4266	100.0	793	100.0	1731	100.0

TABLE XVII. INSTRUMENT PLAYERS IN IMMEDIATE FAMILY

		All Subjects								U.S.A. Subjects			
Index	Players* No. of	Group E-30		Group J-37		Group S-43		Total		Group J-37		Group S-43	
		f	%	f	%	f	%	f	%	f	%	f	%
0	None	241	31.5	245	25.3	597	27.4	1083	27.7	146	21.1	429	26.4
1	(1)	119	15.6	157	16.2	269	12.4	545	14.8	113	16.3	226	13.8
2	1	116	15.3	150	15.4	329	15.2	595	15.5	99	14.8	219	13.5
3	(2)	25	3.2	32	3.3	62	2.8	119	3.1	25	3.6	58	3.4
4	1+(1)	74	9.8	121	12.5	270	12.5	465	11.8	87	12.4	214	13.2
5	2	100	13.2	125	12.9	303	13.9	528	12.5	103	14.9	215	13.5
6	(3) or 2+(1)	14	1.8	36	3.7	70	3.2	120	3.1	33	4.8	63	3.7
7	3	19	2.5	19	2.0	48	2.2	86	2.2	14	2.1	27	1.7
8	(4)	6	0.8	13	1.3	24	1.1	43	1.1	13	1.4	21	1.3
9	More	47	6.2	72	7.4	202	9.3	321	8.2	60	8.6	154	9.5
Total number reporting		761	100.0	970	100.0	2174	100.0	3905	100.0	693	100.0	1626	100.0

*Piano or other keyboard players are indicated without parentheses; players of other instruments shown in parentheses.

The frequency of music making in the home was indicated on a four-point scale by the students, The distribution is tabulated below:

TABLE XVIII. FREQUENCY OF HOME MUSIC MAKING

	All Subjects								U.S.A. Subjects			
Members of family play or sing at home	Group E-30 f	Group E-30 %	Group J-37 f	Group J-37 %	Group S-43 f	Group S-43 %	Total f	Total %	Group J-37 f	Group J-37 %	Group S-43 f	Group S-43 %
Never	286	33.7	292	27.2	744	32.5	1322	31.5	189	25.2	529	30.7
Seldom	202	23.8	284	26.5	544	23.7	1030	24.5	214	27.4	437	25.3
Occasionally	283	33.6	392	36.5	738	32.2	1413	33.4	289	36.9	558	32.3
Frequently	75	8.9	106	9.8	263	11.5	444	10.6	90	11.5	201	11.7
Total number reporting	840	100.0	1074	100.0	2289	100.0	4209	100.0	782	100.0	1725	100.0

The self-estimates of how well each student thought he could sing are shown for each of the three populations in Table XIX.

TABLE XIX. SELF-ESTIMATES OF SINGING SKILL

	All Subjects								U.S.A. Subjects			
Singing Skill	Group E-30		Group J-37		Group S-43		Total		Group J-37		Group S-43	
	f	%	f	%	f	%	f	%	f	%	f	%
Can't carry tune	71	8.3	68	6.3	204	8.9	343	8.1	41	5.2	145	8.3
Can just sing along with others	405	47.3	533	49.6	813	35.3	1751	41.2	374	47.7	633	36.4
Can carry tune alone	226	26.5	278	25.6	657	28.6	1161	27.3	220	28.0	467	27.0
Can sing solos	122	14.2	147	13.6	406	17.6	675	16.1	111	14.5	309	17.8
Can sing for large audience	32	3.7	53	4.9	222	9.5	307	7.3	36	4.6	183	10.5
Total number reporting	856	100.0	1079	100.0	2302	100.0	4237	100.0	782	100.0	1737	100.0

Similar self-estimates of how well they thought they could play an instrument are also presented in tabular form, Table XX below.

TABLE XX. SELF-ESTIMATES OF PLAYING SKILL

Playing Skill	All Subjects								U.S.A. Subjects			
	Group E-30		Group J-37		Group S-43		Total		Group J-37		Group S-43	
	f	%	f	%	f	%	f	%	f	%	f	%
None	222	26.6	205	19.4	447	19.4	874	21.0	122	15.7	335	19.4
Can play simple music; can pick out tune	406	48.8	356	33.1	751	32.8	1512	36.4	234	29.9	516	29.9
Can play moderately difficult music	134	16.2	319	29.7	607	27.0	1061	25.5	267	34.3	452	26.2
Can play difficult music	12	1.4	16	1.5	63	2.7	91	2.2	15	1.9	49	2.8
Play recitals; play professionally	58	7.0	172	16.3	416	18.1	646	14.9	141	18.2	374	21.7
Total number responding	832	100.0	1068	100.0	2284	100.0	4184	100.0	779	100.0	1727	100.0

The extent to which the respondees attend music events such as concerts was indicated by them on a 4-point scale. The distribution of responses is shown in Table XXI.

TABLE XXI. FREQUENCY OF CONCERT ATTENDANCE

	All Subjects								U.S.A. Subjects			
Attends Concerts	Group E-30		Group J-37		Group S-43		Total		Group J-37		Group S-43	
	f	%	f	%	f	%	f	%	f	%	f	%
Never	285	35.0	240	22.6	387	16.2	912	22.0	155	20.0	298	17.2
Occasionally	407	50.0	594	56.2	1303	54.8	2304	55.2	430	55.5	950	55.0
Frequently	53	6.5	98	9.2	337	14.2	488	11.8	87	11.2	255	14.8
Every possible occasion	69	8.5	127	12.0	259	10.4	455	11.0	103	13.3	225	13.0
Total reporting	814	100.0	1059	100.0	2286	100.0	4159	100.0	775	100.0	1728	100.0

To the question, "How musical do you think you are?" the subjects responded by checking a 5-point scale. The distribution of these responses, some of which were obviously over-modest, while others were just as obviously pretentious, is shown in Table XXII.

TABLE XXII. SELF-EVALUATION OF MUSICALITY

	All Subjects								U.S.A. Subjects			
Estimate of Musicality	Group E-30		Group J-37		Group S-43		Total		Group J-37		Group S-43	
	f	%	f	%	f	%	f	%	f	%	f	%
Very much below average	91	11.3	69	6.5	179	7.7	338	8.1	32	4.2	129	7.4
Little below average	157	19.3	156	14.8	346	15.2	659	15.9	101	13.1	254	14.8
Average	314	39.0	451	42.8	847	37.0	1613	38.7	323	41.8	597	34.7
Little above average	188	24.3	323	30.5	752	32.1	1252	30.2	264	34.3	591	34.3
Very much above average	53	6.1	57	5.4	184	8.0	295	7.1	51	6.6	152	8.8
Total reporting	803	100.0	1056	100.0	2288	100.0	4147	100.0	771	100.0	1723	100.0

During one of the rest periods, when students were taking the Music Discrimination Test, a question which does not appear on the Inventory of Music Experience and Training was asked orally: "Do you like to have music playing on radio or record player when you are studying?" Students were to answer by writing "yes," no." or sometimes." The distribution of these answers is shown in Table XXIII.

TABLE XXIII. LIKING MUSIC WHILE STUDYING

	All Subjects								U. S. A. Subjects			
Answer	Group E-30		Group J-37		Group S-43		Total		Group J-37		Group S-43	
	f	%	f	%	f	%	f	%	f	%	f	%
No	76	19.2	121	18.2	334	20.6	531	19.8	53	12.4	200	18.6
Sometimes	114	28.8	203	30.5	627	38.8	944	35.2	108	25.6	395	36.6
Yes	205	52.0	348	51.3	657	40.6	1210	45.0	262	62.0	484	44.8
Total answering	395	100.0	672	100.0	1618	100.0	2685	100.0	423	100.0	1079	100.0

Expressed Preferences for Types of Music

In item 28 of the Inventory of Music Experiences and Training the subject was asked to make a forced choice with regard to his music listening preferences. In each of five groups, the subject was expected to select from four categories of music the two he would prefer for listening. Upon consultation with a graduate class in music education, the author designated two from each group of four as the most representative of concert music, hence music for listening, within that group. One might argue the relative acceptability of some items as concert music, but in a practice run the categories appeared to yield consistant responses.

Below is the list with X's indicating those responses considered correct. Substitute names of categories for the version used in Great Britian, to make the items more clear to British children, are shown in brackets.

> What kind of music do you enjoy? In each of the five groups below check two kinds. Check the two kinds in each group that you would most want to sit and listen to.

1) (X) Symphony orchestra
   ( ) Military band (marches) [bag-pipes]
   (X) Concert band [Military band]
   ( ) Dixieland Jazz band [Jazz band]

2) ( ) Folk songs
   (X) Operatic arias
   ( ) Gospel songs
   (X) Leider (art songs)

3) (X) Chamber music
   (X) Concertos
   ( ) Latin American dance music
   ( ) Square dance music

4) ( ) Western music (cowboy)
   ( ) Rock and roll ["pop"]
   (X) Ballet music
   (X) Concert piano

5) ( ) "Country" music [Folk songs]
   (X) Selections from operas
   (X) Selections from musical shows
   ( ) Blues songs [Blues (jazz) songs]

These music preferences were scored by simply counting the number of responses which corresponded with the ones marked with X above and subtracting one. The distribution of the number of "correct" or "preferred preferences" checked by the students is shown in Table XXIV.

TABLE XXIV. DISTRIBUTION OF MUSIC PREFERENCE SCORES

	All Subjects								U.S.A. Subjects			
Score	Group E-30		Group J-37		Group S-43		Total		Group J-37		Group S-43	
	f	%	f	%	f	%	f	%	f	%	f	%
0	315	40.5	340	33.4	433	19.3	1088	26.9	210	28.2	295	17.6
1	139	17.9	177	17.4	278	12.4	594	14.7	115	15.4	212	12.6
2	113	14.5	151	14.8	306	13.6	570	14.7	115	15.4	225	13.4
3	100	12.8	128	12.6	320	14.3	548	13.7	105	14.2	227	13.5
4	57	7.3	107	10.5	286	12.8	450	11.1	94	12.6	224	13.3
5	31	4.0	67	6.6	234	10.4	332	8.2	60	8.0	179	10.7
6	14	1.8	27	2.6	173	7.7	214	5.3	26	3.5	132	7.9
7	6	0.8	13	1.3	125	5.6	144	3.6	12	1.6	107	6.3
8	2	0.3	8	0.8	61	2.7	71	1.7	8	1.1	54	3.2
9	1	0.1	0	0.0	28	1.2	29	0.7	0	0.0	26	1.5
Total	778	100.0	1018	100.0	2244	100.0	4040	100.0	745	100.0	1681	100.0

Statistical Treatment of the Data

It was not possible to secure complete data on every person in the study; sometimes no SAT scores, for example, were available, sometimes no I.Q., and sometimes pupils skipped items in the Inventory questionnaire. Where data were complete there were 37 pieces of information concerning the person. After this information had been coded, it was transferred to IBM punch cards.

The Indiana University Research and Computing Center then programmed its Data Control 3600/3400 System to compile distributions, a number of which appeared in the section of this report above, to compute correlations between items which might conceivably have causal relationship with music discrimination, and to compute means and standard deviations on test scores for each age group and each school level sampled.

For correlations the program employed was BMD03D CORRELATION WITH ITEM DELETION - VERSION OF NOVEMBER 13, 1964 - HEALTH SCIENCES COMPUTING FACILITY, UCLA, while means and standard deviations were obtained with BMD01D SIMPLE DATA DESCRIPTION - VERSION OF OCTOBER 1, 1966, WITH CATEGORY SORT OPTION - HEALTH SCIENCES COMPUTING FACILITY, UCLA - MODIFIED BY RESEARCH COMPUTING CENTER, INDIANA UNIVERSITY, FROM VERSION OF MAY 20, 1964.

The level of significance for coefficients or correlation was determined by use of a table originated by R. A. Fisher and reprinted by Edwards.[15]

To obtain multiple correlations the computer program used was BMD02R - STEPWISE REGRESSION - VERSION OF DECEMBER 17, 1965 HEALTH SCIENCES COMPUTING FACILITY, UCLA.

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[15] Edwards, Allen L., Statistical Methods for the Behavioral Sciences, Rinehart & Company, Inc., New York, 1954, p. 502.

STANDARDS FOR THE INDIANA-OREGON MUSIC DISCRIMINATION TEST

Three sets of norms were established for the Indiana-Oregon Music Discrimination Test:. one set for a truncated, 30-item test, Test E, which was administered principally to upper elementary and to some junior high school pupils; a second set of norms for a less truncated, 37-item test, Test J, which had been given mainly to junior high school pupils; and a third set for the complete, 43-item test, Test S, which had been administered to both secondary school students and college students.

Tables XXV to XXVII give the mean scores and ranges of scores by age and by grade (form) classification in school, together with centiles for the scores, standard deviation, standard error of the mean, and the number of students tested in each age or grade group.

In categories where the number tested exceeded 150, the standard error of the mean was between 0.28 and 0.75. In all but the smallest categories, then, the standard error of the mean was sufficiently low to indicate that the means, standard deviation, and centiles can be used with confidence to determine a student's relative standing in music discrimination.

When the results of testing with the 30-item test in Great Britain were separated from the domestic (U.S.A.) results, there were too few cases to establish trustworthy norms. Consequently, the norms developed from the combined U.S. and British testing are reported, for they remain the most useful until further testing can be done in this country.

For the 37-item test and the 43-item test the norms reported are based entirely on testing done in the U.S.A. (pages 45 to 47).

Norms based on scores by both U.S.A. and Great Britain subjects are presented on page 48 for the 30-item test and in Appendix C, pages 77 to 79, for the 37- and 43-item tests.

TABLE XXV. UNITED STATES NORMS FOR THE COMPLETE 43-ITEM TEST

Test Scores	Centiles by Ages								
	11	12	13	14	15-16	17-18	19-21	22-25	26+
74								99	99
72							99	95	93
70						99	98	89	87
68					(99)	98	96	83	85
66				(99)		96	94	78	72
64			(99)			94	91	72	68
62					98	92	86	64	66
60		(99)	98	98	97	89	81	60	55
58			97	97	96	84	75	57	53
56			94	95	94	79	67	51	47
54		98	92	93	91	74	59	45	40
52			89	91	87	68	50	38	36
50	(99)	97	84	89	81	62	43	33	32
48		94	81	84	72	57	36	30	30
46	94	92	77	79	68	48	31	23	25
44	87	90	74	72	59	43	25	21	21
42	84	85	67	64	48	37	21	19	17
40	81	75	59	52	38	31	17	17	15
38	68	69	50	39	33	23	13	11	11
36	58	59	39	29	27	19	10		9
34	42	48	32	22	21	12	7	2	
32	38	37	27	15	17	8	5		
30	29	31	20	12	11	6	3		
28	19	27	14	8	8	5	2		6
26	10	19	10	4	4	3			
24	6	12	5	3	3	2	1		
22		6	3	2		1			
20	3	3	2		2				2
18		2	1						
16				(1)	1				
14		(1)							
12	(1)								
N	31	118	159	121	435	476	321	47	47
Range	30	54	51	51	62	61	53	41	57
Mean	33.9	33.7	38.2	39.5	41.3	45.9	50.2	55.1	54.6
S.D.	7.2	8.6	9.8	8.5	9.7	10.9	10.4	11.8	13.2
Std. Error of Mean	1.28	0.79	0.78	0.77	0.47	0.50	0.58	1.70	1.93

TABLE XXV. UNITED STATES NORMS FOR THE COMPLETE 43-ITEM TEST (cont.)

Test Scores	Centiles by Grades or Academic Classification							
	6	7	8-9	10-12	College Non-music	Post-grad. Non-music	Music Major Under-grad.	Music Major Grad.
74								99
72							99	87
70						99	96	71
68					99	96	92	61
66				99	98		86	42
64			99	98	97		82	32
62				97	95	92	72	25
60			98	95	94	83	60	19
58			96	93	92	79	49	13
56			93	91	87	67	39	6
54			90	87	80	61	30	
52			87	83	72	57	21	3
50	99	99	82	77	64	52	15	
48		95	79	70	55	45	11	
46	98	93	73	63	47	35	8	
44	95	91	68	55	40	31	4	
42	91	86	55	46	34	22	3	
40	90	75	48	38	27	19	2	(1)
38	73	71	38	30	21	17		
36	68	58	29	24	15	13		
34	52	48	21	17	11			
32	47	41	15	13	7			
30	35	32	12	9	5	4	(1)	
28	30	25	8	7	2			
26	20	17	4	4		1		
24	10	11	2	2	1			
22	5	6	1					
20		3		1				
18	3	2						
16								
14		1						
12	1							
N	59	158	247	708	304	23	232	31
Range	40	41	43	59	60	43	53	19
Mean	31.8	33.4	40.5	42.5	45.4	49.7	57.0	65.6
S.D.	7.3	7.9	9.0	9.9	9.5	10.9	7.6	5.7
Stand. Error of Mean	0.94	0.36	0.58	0.37	0.54	2.27	0.51	1.01

TABLE XXVI. UNITED STATES NORMS FOR THE 37-ITEM TEST

Centiles by Ages					Test Scores	Centiles by Grades		
11	12	13	14	15-16		6	7	8-9
					60			
				99	58			
	99	99	99	98	56			99
99		98	98	97	54			97
		97	97	95	52		(99)	95
98	98	96	95	93	50			93
	97	92	92	91	48	99	97	90
97	92	88	89	87	46		92	86
96	86	84	83	81	44	98	88	80
95	78	79	78	72	42	97	81	73
94	74	73	69	65	40	93	76	66
92	67	64	56	54	38	90	68	55
83	57	52	42	43	36	85	59	42
70	48	39	32	26	34	78	47	29
62	37	30	24	20	32	72	37	21
55	26	20	19	14	30	57	25	15
45	18	14	13	9	28	44	17	13
36	13	10	8	5	26	33	13	6
28	8	7	4	3	24	17	8	4
16	4	4	3	2	22	11	4	3
10	3	3	2		20	7	3	2
8	2	2		1	18	4	2	1
6	1	1	1		16	3		
4					14	1	1	
3					12			
2					10			
					8			
1					6			
57	233	285	186	46	Number	72	378	353
45	49	48	47	34	Range	39	52	48
27.5	33.7	34.9	35.9	37.3	Mean Score	28.3	33.7	36.5
7.4	7.8	8.0	7.7	7.5	Standard Deviation	6.8	7.8	7.8
0.97	0.51	0.47	0.56	1.10	Standard Error of Mean	0.80	0.40	0.42

TABLE XXVII. NORMS FOR THE 30-ITEM TEST * USA AND GB SUBJECTS

Centiles by Ages							Test Scores	Centiles by Grades				
10	11	12	13	14	15-16	17-18		5	6 (1)*	7 (2)*	8-9 (3-4)*	10-12 (5-6)*
						99	50					99
			99		99	96	48					97
		99			98	88	46			99		94
					97	76	44					90
	99		98	98	95	72	42		99	98	99	85
99	98	98	97		91	64	40			96	98	80
		97	93		86	56	38	99	98	93	95	72
98	97	94	88	92	75	54	36	98	97	90	91	63
	95	92	83	88	66	52	34	96	96	83	89	54
97	90	86	76	85	53	48	32	94	92	76	80	46
91	84	79	68	73	40	36	30	89	85	68	66	34
81	75	69	58	65	29	24	28	82	77	57	46	23
69	64	57	46	54	20	14	26	71	65	45	30	14
56	49	45	31	42	15	8	24	61	50	34	21	10
46	36	32	22	23	9	6	22	50	37	21	12	7
30	23	20	12	15	3	4	20	36	22	13	5	4
15	14	13	9	12	2		18	19	14	10	2	1
8	8	7	6	8			16	10	8	5		
5	5	3	2				14	6	4	2		
2	2	2	1				12	5	2	1		
1		1		4			10	3	1			
							8	2				
							6	1				
123	263	302	163	26	55	25	Number Tested	127	443	265	56	70
32	43	47	33	33	31	31	Range	37	46	41	27	33
23.1	24.3	25.2	27.3	26.7	31.6	35.4	Mean Score	22.7	24.1	27.3	28.3	33.6
5.4	6.2	6.5	6.7	7.3	6.6	8.8	S. D.	6.2	5.8	7.0	5.3	7.5
0.49	0.38	0.37	0.52	1.42	0.90	1.75	Std. Error	0.55	0.28	0.43	0.71	0.90

FINDINGS CONCERNING RELATIONSHIPS BETWEEN MUSIC DISCRIMINATION TEST SCORES AND VARIOUS FACTORS AND BETWEEN THESE FACTORS

Correlations with Music Discrimination Test Scores

The coefficients of correlation between scores on the Indiana-Oregon Music Discrimination Test and the various factors on which data were collected are shown separately for the three test groups (E-30, those taking the 30-item test; J-37, for those taking the 37-item test; and S-43, those taking the 43-item test) in Table 5 on page 5 of this report.

Ignoring the high correlations of total test scores with the A-B-No scores and with the R-H-M scores, because the total score is merely the addition of the other two, we found that for group S-43 USA subjects the highest correlation, 0.71, is between S A T - Verbal scores and intelligence (I. Q.); next highest, 0.69, was between S A T - Mathematical Reasoning scores and intelligence, followed by 0.66 between S A T Verbal and S A T - Math scores; nearly as high, 0.65, was the correlation between the number of wind and percussion instruments in the home and the total number of instruments in the home; and the correlations of self-estimate of how well subjects can play an instrument with self-estimates of how musical they are and with years of band and/or orchestra experience are equal, 0.61.

The highest correlations of the Music Discrimination Test scores for the USA S-43 group were with:

grade in school 0.58
expressed preferences for concert type music 0.56
years of piano study 0.54
self-estimates of how well subjects can play an instrument 0.50
intelligence (I. Q.) 0.48
age 0.46
self-estimates of how musical one is 0.46
achievement in school 0.41
frequency of concert attendance 0.40
S A T - Verbal scores 0.39
total number of instruments in the home 0.39
self-estimates of how well one can sing 0.35
years of choral experience 0.35
years of voice lessons 0.34
socio-economic index 33
years of band/orchestra experience 0.32

For the USA J-37 group the highest coefficients of correlation obtained were between school achievement and S A T - Math scores, 0.65, and between intelligence (I. Q.) and S A T - Verbal scores, 0.64. The correlation between S A T - Verbal and school achievement was 0.62, while that between S A T - Verbal and S A T - Math was 0.60. The correlation of the number of wind and percussion instruments in the home with the total number of musical instruments in the home was 0.58.

For this J-37 Group the high correlations of Music Discrimination Test scores were with:

self-estimates of how well one can play an instrument	0.40
total number of instruments in the home	0.38
years of piano lessons	0.33
socio-economic index	0.30
size of community	-0.30

Other Relationships - Group S-43 - USA Subjects

With respect to group S-43 a matrix of the coefficients of correlation between all the factors studied, including music discrimination, was prepared and it is presented in Table XXVIII, on pages 52 to 59.

If we limit consideration to those coefficients of correlation which are 0.333 or above (or -0.333 or below), we find that music discrimination as measured by the Indiana-Oregon Test correlated with fifteen of the environmental or music training and experience factors. These were listed on page 49.

Self-evaluation of musicality, that is, the subject's rating of how musical he thinks he is, had correlations above 0.333 with ten elements:

self-evaluation of how well one can play an instrument	0.61
self-evaluation of how well one can sing	0.50
music discrimination test scores	0.46
frequency of concert attendance	0.41
Years of piano lessons	0.38
number of additional instruments learned to play	0.38
band/orchestra experience	0.37
years of choral experience	0.37
expressed preferences for concert type music	0.37
total number of instruments in the home	0.37

Correlation coefficients above 0.333 were found between students' estimates of how well they can play an instrument and:

self-evaluation of musicality	0.61
band/orchestra experience	0.61
Music Discrimination Test scores	0.50
total number of instruments in the home	0.48
additional instruments played	0.47
years of piano lessons	0.46
wind or percussion instruments in the home	0.39
frequency of concert attendance	0.38
expressed preferences for concert type music	0.34

The total number of musical instruments, including radios and record players, in a student's home was related to other factors as follows:

wind and percussion instruments in the home	0.65
keyboard instruments in the home	0.56
string instruments in the home	0.51
number of others in the family who play instruments	0.50
self-estimate of how well one can play an instrument	0.48
band/orchestra experience	0.40
music discrimination scores	0.39
additional instruments played	0.39
self-evaluation of musicality	0.37

Choral experience had correlation coefficients above 0.333 with these factors:

self-estimate of how well one can sing	0.55
years of voice lessons	0.52
years of piano lessons	0.41
self-evaluation of musicality	0.37
expressed preferences for concert type music	0.39
music discrimination scores	0.35
grade in school	0.33

Piano experience, that is, years of piano lessons, was found to be related to other factors to the extent indicated by the coefficients:

music discrimination scores	0.54
self-estimate of how well one can play an instrument	0.46
expressed preferences for concert type music	0.42
choral experience	0.41
grade in school	0.39
years of voice lessons	0.40
keyboard instruments in the home	0.40
self-evaluation of musicality	0.38
frequency of concert attendance	0.35
school achievement	0.33

TABLE XXVIII. CORRELATION MATRIX - PART 1 - GROUP S-43, USA

	Age	Grade	Piano lessons	Other instr. lessons	Play other instrs.	Band-orch. exper.	Choral exper.	Voice lessons
Age		.83	.26	.25	.15	.17	.20	.29
Grade	.83		.39	.32	.23	.20	.33	.41
Piano lessons	.26	.39		.26	.22	.21	.41	.40
Other instr. lessons	.25	.32	.26		.34	.56	.12	.14
Play other instrs.	.15	.23	.22	.34		.49	.15	.13
Band & orch. exper.	.17	.20	.21	.56	.49		.02#	.04#
Choral exper.	.20	.33	.41	.12	.15	.02#		.52
Voice lessons	.29	.41	.40	.14	.13	.04#	.52	
Keyboard instrs. in home	.11	.20	.40	.16	.21	.11	.21	.19
String instrs. in home	.09	.17	.17	.17	.19	.15	.15	.14
Wind & percus. in home	.01#	.06*	.10	.26	.33	.45	-.01#	-.04#
Radios & Record player	.13	.10	.10	.06*	.06#	.08	.06*	.04#
Total instrs in home	.11	.20	.32	.29	.39	.40	.17	.13
Others in family play	.05*	.13	.32	.16	.18	.15	.18	.14
Home music making	-.02#	.03#	.18	.02#	.12	.01#	.29	.20
How well can sing	.13	.23	.28	.07*	.21	.10	.55	.45

*significant at 5% level #not significant

TABLE XXVIII. (Cont.) CORRELATION MATRIX - PART 2

	Age	Grade	Piano lessons	Other instr. lessons	Play other instrs.	Band-orch. exper.	Choral exper.	Voice lessons
How well can play	.14	.26	.46	.44	.47	.61	.19	.16
Attends concerts	.29	.43	.35	.27	.28	.26	.35	.33
Self-eval. of musicality	.12	.23	.38	.29	.38	.37	.37	.28
Preference score	.39	.51	.42	.27	.23	.19	.39	.39
Like to study to music	-.22	-.29	-.17	-.05#	-.04#	-.00#	-.08*	-.20
Rural-urban	.23	.10	.05#	-.06#	.07*	-.11	.07*	.07*
Socio-economic index	.16	.20	.25	.07*	.03#	.00#	.15	.07*
S A T verbal	.17	.13*	.29	.00#	-.07#	.03#	.16	.03#
S A T math	.07#	.05#	.19	-.01#	-.01#	.07#	.04#	-.05#
I. Q.	.14	.28	.28	.14	.12	.07*	.09	.13
School achievement	.14	.25	.33	.21	.10	.20	.14	.15
A-B-No score	.44	.54	.46	.28	.26	.25	.31	.32
R-H-M score	.42	.54	.53	.33	.32	.34	.36	.32
Total music discrim. score	.46	.58	.54	.33	.31	.32	.35	.34

*significant at 5% level # not significant

2

TABLE XXVIII. (Cont.) CORRELATION MATRIX - PART 3

	Instruments in the home							
	Key-board	String	Winds & percussion	Radios & rec. player	Total number	Others in family play	Home music making	How well can sing
Age	.11	.09	.01#	.13	.11	.05#	.02#	.13
Grade	.20	.17	.06*	.10	.20	.13	.03#	.23
Piano lessons	.40	.17	.09	.10	.32	.32	.18	.28
Other instr. lessons	.16	.17	.26	.06*	.29	.16	.02#	.07*
Play other instrs.	.21	.19	.33	.06#	.39	.18	.12	.21
Band & orchestra experience	.11	.15	.45	.08	.40	.15	.01#	.10
Choral experience	.21	.15	-.01#	.06*	.17	.18	.29	.55
Voice lessons	.19	.14	-.04#	.04#	.13	.15	.20	.45
Keyboard instrs. in home		.14	.18	.14	.56	.41	.21	.20
String instrs. in home	.14		.13	.11	.51	.25	.12	.11
Wind & percussion in home	.18	.13		.11	.65	.30	.07	.09
Radios & record player	.14	.11	.11		.32	.12	.01#	.07
Total instruments in home	.56	.51	.65	.32		.50	.21	.20
Others in family play	.41	.25	.30	.12	.50		.31	.18
Home music making	.21	.12	.07	.01#	.21	.31		.31
How well can sing	.20	.11	.09	.07	.20	.18	.31	

* significant at 5% level # not significant

TABLE XXVIII. (Cont.) CORRELATION MATRIX - PART 4

	Instruments in the home							
	Key-board	String	Winds & percussion	Radios & rec. player	Total number	Others in family play	Home music making	How well can sing
How well can play	.31	.19	.39	.17	.48	.25	.16	.30
Attend concerts	.16	.12	.18	.11	.24	.15	.20	.30
Self-eval. of musicality	.24	.18	.26	.16	.37	.23	.23	.50
Preference score	.24	.20	.08	.12	.25	.17	.11	.32
Like to study to music	-.09	-.07*	-.02#	.03#	-.06#	-.12	-.07*	-.06#
Rural-urban	.04#	.05#	-.06*	.08	.01#	.05#	.04#	.05#
Socio-economic index	.23	.16	.11	.17	.26	.28	.00#	.10
S A T verbal	.12	.19	.12*	.19	.25	.18	-.03#	.06#
S A T math	.10*	.03#	.13	.10	.20	.14	-.12	-.04#
I. Q.	.21	.16	.09	.14	.29	.19	.01#	.11
School achievement	.20	.11	.16	.12	.26	.19	.07*	.17
A-B-No score	.26	.20	.14	.17	.31	.21	.10	.32
R-H-M score	.34	.24	.22	.19	.41	.27	.13	.37
Total music discrimination score	.32	.24	.20	.19	.39	.26	.13	.37

* significant at 5% level # not significant

TABLE XXVIII. (Cont.) CORRELATION MATRIX - PART 5

	How well can play	Attend concerts	Self-eval. musicality	Preference score	Like study to music	Rural-urban	Socio-econ. index
Age	.14	.29	.12	.39	-.22	.23	.16
Grade	.26	.43	.23	.51	-.29	.10	.20
Piano lessons	.46	.35	.38	.42	-.17	.05#	.24
Other instr. lessons	.44	.27	.29	.27	-.05#	-.06#	.07#
Play other instrs.	.47	.28	.38	.23	-.04#	.07*	.03#
Band & orchestra experience	.61	.26	.37	.19	-.00#	-.11	.00#
Choral experience	.19	.35	.37	.39	.08	.07*	.15
Voice lessons	.16	.33	.28	.39	-.20	.07*	.07*
Keyboard instrs. in home	.31	.16	.24	.24	-.09	.04#	.23
String instrs. in home	.19	.12	.18	.20	-.07*	.05#	.16
Wind & percussion in home	.39	.18	.26	.08	-.02#	-.06*	.11
Radios & record player	.17	.11	.16	.12	.03#	.08	.17
Total instruments in home	.48	.24	.37	.25	-.06#	.01#	.26
Others in family play	.25	.15	.23	.17	-.12	.05	.28
Home music making	.16	.20	.23	.11	-.07*	.04#	.00#
How well can sing	.30	.30	.50	.32	-.06#	.05#	.10

* significant at 5% level # not significant

TABLE XXVIII. (Cont.) CORRELATION MATRIX - PART 6

	How well can play	Attend concerts	Self-eval. musicality	Preference score	Like to study to music	Rural-urban	Socio-econ. index
How well can play		.37	.61	.34	-.07	-.03#	.17
Attend concerts	.38		.41	.46	-.09	.11	.11
Self-eval. of musicality	.61	.41		.37	-.07*	.08	.17
Preference score	.34	.46	.37		-.16	.13	.24
Like to study to music	-.07*	-.09	-.07*	-.16		-.06#	-.13
Rural-urban	-.00#	.11	.08	.13	-.06#		.16
Socio-economic index	.17	.11	.17	.24	-.13	.16	
S A T verbal	.21	.11*	.18	.23	.08#	.17	.33
S A T math	.18	.03#	.14	.13	.00#	.09*	.17
I. Q.	.26	.22	.20	.36	-.15	.15	.33
School achievement	.33	.20	.24	.31	-.19	-.06*	.25
A-B-No score	.41	.36	.37	.52	-.19	.12	.30
R-H-M score	.52	.38	.48	.53	-.21	.10	.32
Total music discrimination score	.50	.40	.46	.56	-.22	.11	.33

* significant at 5% level # not significant

TABLE XXVIII. (Cont.) CORRELATION MATRIX - PART 7

	SAT Verbal	SAT Math	I. Q.	School Achievement	A-B-No score	R-H-M score	Total Music Discr. score
Age	.17	.07#	.14	.14	.44	.42	.46
Grade	.13*	.05#	.28	.25	.54	.54	.58
Piano lessons	.29	.20	.28	.33	.46	.53	.54
Other instr. lessons	.00#	-.01#	.14	.21	.28	.33	.33
Played other instrs.	-.07#	-.01#	.12	.10	.26	.32	.31
Band & orchestra exper.	.03#	.08#	.07*	.20	.25	.34	.32
Choral exper.	.16	.04#	.09	.14	.31	.36	.35
Voice lessons	.03#	-.05#	.13	.15	.32	.32	.34
Keyboard instrs. in home	.17	.10*	.21	.20	.26	.34	.32
String instrs. in home	.05#	.03#	.16	.11	.20	.24	.24
Wind & percuss. in home	.12*	.13	.09	.16	.14	.22	.20
Radios & record player	.19	.10*	.14	.12	.17	.19	.19
Total instruments in home	.25	.20	.28	.26	.31	.41	.39
Others in family play	.18	.14	.19	.19	.21	.27	.26
Home music making	-.03#	-.12	-.01#	.07*	.10	.13	.13
How well can sing	.06#	-.04#	.11	.17	.32	.37	.37

* significant at 5% level   # not significant

TABLE XXVIII. (Cont.) CORRELATION MATRIX - PART 8

	S A T Verbal	S A T Math	I. Q.	School Achievement	A-B-No score	R-H-M score	Total Music Discr. score
How well can play	.21	.18	.26	.33	.41	.42	.50
Attend concerts	.11#	.03#	.18	.20	.34	.38	.40
Self-eval. of musicality	.18	.14	.20	.25	.37	.48	.46
Preference score	.23	.13	.36	.31	.52	.53	.56
Like to study to music	.08#	.00#	-.15	-.19	-.19	-.21	-.22
Rural-urban	.17	.09*	.16	-.06*	.12	.10	.11
Socio-economic index	.33	.17	.33	.25	.30	.32	.33
S A T verbal		.66	.71	.46	.36	.37	.39
S A T math	.66		.69	.45	.23	.24	.26
I. Q.	.71	.69		.52	.43	.46	.48
School achievement	.46	.45	.52		.35	.40	.41
A-B-No score	.36	.23	.43	.35		.75	.93
R-H-M score	.37	.24	.46	.40	.75		.94
Total music discrimination score	.39	.26	.48	.41	.93	.94	

* significant at 5% level # not significant

Expressed preferences for concert type music correlated with other factors to these degrees:

music discrimination test scores 0.56
grade in school 0.51
frequency of concert attendance 0.46
years of piano lessons 0.42
age 0.39
choral experience 0.39
years of voice lessons 0.39
self-evaluation of musicality 0.37
I. Q. 0.36
self-estimate of how well one can play an instrument 0.34

Extent of band and/or orchestra experience was found to have correlation coefficients above 0.333 with these factors:

self-estimate of how well one can play an instrument 0.61
years of lessons on instruments other than piano 0.56
additional instruments played 0.49
wind or percussion instruments in the home 0.40
total number of musical instruments in the home 0.40
self-evaluation of musicality 0.37

The correlation with music discrimination test scores was positive and statistically significant with a coefficient of 0.32.

Frequency of concert attendance, one of the acknowledged goals of music educators, was found to correlate above the 0.333 level with:

expressed preferences for concert-type music 0.46
self-evaluation of musicality 0.41
music discrimination test scores 0.40
self-estimate of how well one can play an instrument 0.38
choral experience 0.35
years of piano lessons 0.35
grade in school 0.43

SAT - Verbal scores and SCAT - Verbal scores, whichever were available, were converted to standard scores and then correlated with other factors with the following results:

I. Q. 0.71
SAT - Math 0.66
school achievement 0.46
music discrimination testscores 0.39
socio-economic index 0.33

Other Relationships - Group J-37 - USA Subjects

Correlation coefficients above the 0.333 level and significant at the 1% level were compiled for the J-37 Group which took the 37-item test. The total number of instruments in the home had the greatest number of such correlations:

wind and percussion instruments in the home 0.58
keyboard instruments in the home 0.57
number of others in the family who play instruments 0.52
string instruments in the home 0.47
self-estimate of how well one can play an instrument 0.45
music discrimination test scores 0.38
radio and record players in the home 0.37
socio-economic index 0.36

The students' self-estimates of how well they can play instruments had these correlations with other factors:

band and/or orchestra experience 0.47
self-evaluation of musicality 0.46
number of instruments in the home 0.45
years of piano lessons 0.40
music discrimination test scores 0.39
wind and percussion instruments in the home 0.35

For the J-37 Group band and/or orchestra experience was found to correlate at 0.333 or above with:

self-estimate of how well one can play an instrument 0.47
years of lessons on instruments other than piano 0.36
additional instruments learned 0.35
wind and percussion instruments in the home 0.33

To a much greater extent than did choral experience or years of piano lessons, band and/or orchestra experience correlated (0.30) with responses to the R-H-M portion of the music discrimination test than with the A-B-No portion (0.16). Band and/or orchestra experience correlated 0.27 with the total test scores compared to 0.09 for choral experience with test scores.

Piano experience (years of lessons) correlated 0.33 with music discrimination test scores and with other factors as follows:

self-estimate of how well one can play an instrument 0.40
total number of musical instruments in the home 0.33
S A T - Verbal scores 0.33

For the J-37 Group S A T - Verbal scores correlated with:

I. Q. 0.64
S A T - Math scores 0.60
school achievement 0.62
socio-economic index 0.33
years of piano experience 0.33

Other Relationships - Group E-30 - All Subjects

Considering only correlation coefficients above 0.333 for both the United States and Great Britain upper-elementary--junior high populations, E-30, which took the truncated, 30-item test, we found the greatest number of such correlations with band and/or orchestra experience and with the total number of instruments in the home. With band and/or orchestra experience we found the following correlations:

S A T - Verbal	0.69
years of lessons on instruments other than piano	0.60
self-estimate of how well one can play an instrument	0.55
years of piano lessons	0.42
additional instruments played	0.39
neatness of responses on test answer forms	0.38
string instruments in the home	0.35
total number of instruments in the home	0.35
self-evaluation of musicality	0.35

With the total number of musical instruments in the home the following correlations were computed:

keyboard instruments in the home	0.59
string instruments in the home	0.54
wind and percussion instruments in the home	0.54
others in the family play instruments	0.46
self-estimate of how well one can play an instrument	0.43
years of piano lessons	0.43
additional instruments learned	0.41
radios and record player in the home	0.37
band and/or orchestra experience	0.35

For this group, E-30, the correlations with the years of piano lessons were:

self-estimate of how well one can play an instrument	0.50
number of musical instruments in the home	0.43
band and/or orchestra experience	0.42
keyboard instruments in the home	0.38
choral experience	0.37
years of lessons on instrument other than piano	0.36
number of others in family who play instruments	0.35
S A T - Verbal	0.35
music discrimination scores	0.37

Pupils' self-estimates of how well they play instruments correlated as follows with other factors:

band and/or orchestra experience	0.55
years of piano lessons	0.50
self-evaluation of musicality	0.44
total number of musical instruments in the home	0.43
years of lessons on instrument other than piano	0.40
additional instruments played	0.38

For the E-30 groups these correlations were found between SAT - Verbal scores and the factors listed:

I. Q.	0.81
SAT - Math	0.69
band and/or orchestra experience	
school achievement	0.44

Multiple Correlations

Stepwise regression computation was used to obtain multiple correlations with music discrimination test scores. When ten variables were selected for this computation the computer sorted out 498 cards in the S-43 group with complete data for all ten variables. The ten variables and the accumulative multiple correlations when the variables are added in order of their correlative power with music discrimination scores are shown below for all S-43 subjects in both the United States and Great Britain:

		R	F value
years	of piano lessons	0.4899	156.7
plus	band and/or orchestra experience	0.5616	54.4
plus	school achievement	0.6057	40.3
plus	choral experience	0.6303	24.9
plus	socio-economic index	0.6493	20.6
plus	others in family who play instruments	0.6555	7.1
plus	years of voice lessons	0.6577	2.5
plus	number of instruments in the home	0.6595	2.0
plus	years of lessons on instruments other than piano	0.6596	0.2
plus	frequency of home music making	0.6597	0.1

From the United States S-43 Group's cards the computer selected 292 with complete data on the ten variables and calculated the following multiple correlations with music discrimination test scores:

		R	F value
years	of piano lessons	0.4262	64.3
plus	band and/or orchestra experience	0.5308	40.3
plus	school achievement	0.5782	22.8
plus	choral experience	0.6087	16.5
plus	number of instruments in the home	0.6230	8.2
plus	socio-economic index	0.6309	4.7
plus	years of voice lessons	0.6366	3.4
plus	others in family who play instruments	0.6378	0.7
plus	years of study on instruments other than piano	0.6381	0.2
plus	frequency of home music making	0.6383	0.1

From these multiple correlations it is clear that, even in combination with piano experience, band, orchestra and choral experiences make significant contributions to music discrimination.

To show how various factors relate to both music discrimination and concurrently to expressed preferences for concert type music, Figure 1 on the next page has been constructed.

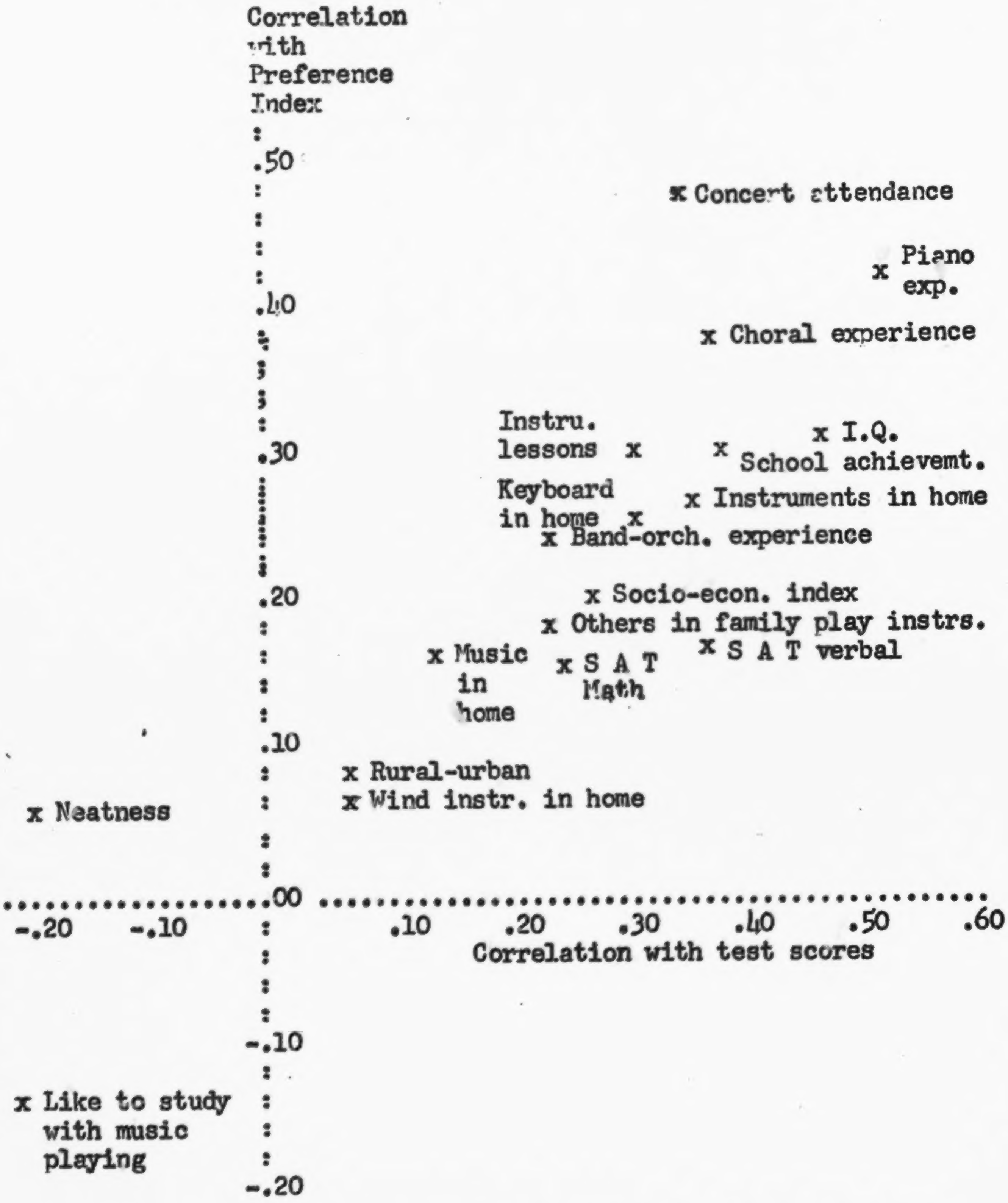

FIGURE 1 - CONCURRENT CORRELATIONS WITH MUSIC DISCRIMINATION SCORES AND EXPRESSED PREFERENCE FOR CONCERT MUSIC BASED ON DATA FROM BOTH USA AND GREAT BRITAIN S-43 SUBJECTS

CONCLUSIONS AND RECOMMENDATIONS

The Indiana-Oregon Music Discrimination Test proved to be a useful and dependable tool for measuring some aspects of music appreciation among students in secondary schools and colleges. It proved less dependable with upper elementary pupils, especially those in fifth grade; consequently, the construction of a similar, but simpler test for use in upper elementary grades should be undertaken.

The mean scores for the various age groups and academic levels confirmed the basic validity of the Indiana-Oregon Music Discrimination Test, inasmuch as the progressive increases by age or grade were consistent and logical.

Of the factors studied which music educators can to an extent provide or control, piano instruction appears to be the most effective means of developing music discrimination. (While the fact that the Indiana-Oregon Music Discrimination Test contains more items from piano literature than from other music may account in some measure for the high correlations between years of piano study and music discrimination, it does not negate the above conclusion, because the author has demonstrated that pianists also excell in their discrimination of non-piano items.)

While piano lessons, then, appear to be the surest means, among those studied, for developing music discrimination in students, singing in choruses and playing in bands and orchestras were also shown to raise levels of music discrimination and to increase the preferences for concert type music.

The hypothesis, (a) on page 7, that boys and girls would score alike on music discrimination was tested for the combined USA and Great Britain population by calculating the means for boys and girls in the J-37 group, this population being selected on the assumption that factors of music training and experience would tend to be more equal for the two sexes at this age level than at a more mature one. The mean music discrimination score for 50 twelve-year-old boys was 33.2; for 39 twelve-year-old girls it was 34.6. Among thirteen-year-old students the mean for 56 boys was 35.4; for 70 girls it was 36.1. Among fourteen-year-olds the mean for 46 boys was 33.9; for 39 girls, 36.5. The mean for 183 boys of mixed ages was 33.7, while it was 35.4 for 171 girls. While the girls consistently out-scored the boys, it was by such a small margin that the hypothesis is scarcely refuted. It is quite possible that, if factors such as piano experience were equated, the differences observed might disappear or be reversed.

All other hypotheses were tested using USA data exclusively. The hypothesis, (b), that there is no difference between rural and urban populations in their ability to make music discriminations was sustained. The coefficient 0.11 between music discrimination and size of community, for S-43, the large older group, while barely significant at the 1% level, was off-set by the -0.30 coefficient for the J-37 group. If a coefficient for the combined groups could be computed, it would probably be below the 5% level of significance.

The hypothesis, (c), that socio-economic level is unrelated to music discrimination was refuted by significant correlation coefficients of 0.33, 0.30 and 0.29 for the three groups.

That there is a significant difference in ability to make musical judgments by those who have learned to play music instruments compared to the ability of those who have not learned to play instruments (hypothesis d) was substantiated by correlations of 0.36, 0.33, and 0.54 with years of piano lessons and 0.28, 0.17 and 0.33 with years of study on other instruments.

It was not determined which instrument, other than piano, most enhanced music discrimination through lessons thereon.

The computed data do not give a clear answer whether hypothesis (f), that people who begin private music study at an early age are most likely to excell in music discrimination, is confirmed, but the author's inspection of the questionnaires leads him to believe that the hypothesis could be substantiated if a differently designed inventory of music training were used.

The hypothesis, (g), that there is a positive relationship between frequency of concert attendance and music discrimination was clearly substantiated (coefficient 0.40) for the S-43 group which contained many college students, but less so for the J-37 group (0.13) and the E-30 group (0.08, significant at the 5% level).

The hypothesis, (h), that students whose homes had FM radios would score better in music discrimination than students whose homes did not was tested by obtaining the mean score for those who, in Inventory items 20 and 21, checked only "radio" and comparing it with the mean score of those who checked only "FM radio." These means were 31.0 and 33.0 respectively. Similarly the mean score for those checking "radio" and "record player" were compared with the mean score of those checking "FM radio" and "record player." These means were 33.3 and 35.3 respectively, the population considered being the U. S. A. portion of the J-37 group. While numerically the hypothesis is supported, the implied influence of FM radio may be discounted by the fact that, for this population, Socio-Economic index correlated 0.21 with number of radios and record players in the home and Socio-Economic index also correlated 0.30 with music discrimination scores. It is possible that other aspects of socio-economic circumstances (other than radios and record players) may be responsible for the observed differences.

The hypothesis, (i), that the relationship between intelligence and music discrimination is low, but positive, was confirmed as to the positive aspect, but the correlation coefficients of 0.38, 0.30 and 0.48 were higher than anticipated.

The parallel hypothesis, (j), that correlation of school achievement and music discrimination would be low and positive was only a little nearer being confirmed. The coefficients, 0.28, 0.29

and 0.41, were all positive and statistically significant, but not as high as the correlations with intelligence (I.Q.).

The hypothesis, (k), that students having parents that play or sing would score better in music discrimination was not directly tested by the data collected. However, the responses to the question, "How many persons in your family, not including yourself, play piano? Play other instruments?" did show positive, low correlation with music discrimination, 0.14, 0.23 and 0.26 being the coefficients. The responses to the question regarding frequency of music making (singing or playing) in the home were also positive in their correlation with music discrimination, but the coefficients were all low - 0.10, 0.12 and 0.13.

The hypothesis, (l), that persons who express preferences for listening to "serious" (concert) music will score higher on music discrimination was confirmed by these coefficients of correlation: 0.18 for the youngest group (E-30), 0.28 for the "teen-age" group (J-37), and 0.56 for the high school-college group (S-43).

Comparison of A-B-No and R-H-M Scores

The A-B-No portion of the Indiana-Oregon Music Discrimination Test requires the subject to make a judgment about the over-all "rightness" or artistic consistence of the two versions of each item, whereas the R-H-M portion requires an analytical response in that the subject must determine which element of the music (rhythm, harmony or melody) is different in the two versions. As is shown in Table XXIX below, the subjects in all three groups were better able to make the over-all (Gestalt?) A-B-No judgment than the analytical rhythm-harmony-melody judgment.

TABLE XXIX. MEAN A-B-NO AND R-H-M SCORES

	Group E-30	Group J-37	Group S-43
Mean A-B-No score	14.0	17.9	23.4
Mean R-H-M score	11.7	16.4	21.9

These differences shown in Table XXIX would be greater if the test scoring procedure did not allow either of two R-H-M responses to be considered correct on four items of the 30-item test, on five items of the 37-item test, and on six items of the 43-item test.

The data in Table XXIX suggest that "wholistic" as well as analytical methods need to be used in teaching for understanding and enjoyment of music. Present emphasis in professional literature on analytical approaches to the study of music is properly directed toward overcoming a weakness revealed by this project, but, on the other hand, an analytical approach fails to take advantage of the ability of children to sense the over-all "rightness" or "wrongness" of musical examples.

In this connection we may find a partial explanation for the high correlations between years of piano lessons and music discrimination. It may be because the person who plays piano deals with the whole piece of music, that is, he is simultaneously performing its melody, its harmony and its rhythm, that he excells in making the musical judgments concerned with the "rightness", the artistic consistancy of the piece as a whole.

Miscellaneous Recommendations

Parallel forms of the Indiana-Oregon Music Discrimination Test should be constructed to facilitate periodic testing and retesting of music discrimination in longitudinal research studies or in measuring improvement of music discrimination through instruction in music classes.

It had been one of the objectives of this study to determine the correlation between music aptitude and music discrimination, but extensive testing of music aptitude in addition to music discrimination would not have allowed the author to secure enough music discrimination test scores to determine norms within the time available. Therefore it is recommended that a study be made to see what relationships there might be between scores on the Indiana-Oregon Test and such music aptitude measures as the Gordon Musical Aptitude Profile and the Wing Standardized Tests of Musical Intelligence.

The Indiana-Oregon Music Discrimination Test should be used in research evaluating the degree to which various methods of teaching general music classes and the course content affect the development of music discrimination.

Experimenters who wish to evaluate the results of including more teaching about music periods and styles, more teaching of music theory and analytical listening in the instruction of school choruses, orchestras and bands could use the test as one of their tools.

A more analytical study than that included within this project should be made of the relationships between having various kinds of music as background for study and scholastic achievement and development of music discrimination.

Some of the techniques employed in this study might used in essaying the effects of children's concerts upon music discrimination development and upon the musical preferences of children.

APPENDIX A

INVENTORY OF MUSIC EXPERIENCE AND TRAINING

AND PORTION OF TEST SCORE SHEET

INVENTORY OF MUSIC EXPERIENCE AND TRAINING

1-4 Name ______________________

5-6 Age ______ years ( ) Male ( ) Female

7 Grade in school (or college) ________

8 Occupation, if not a student ________

9 Have you ever had private lessons on piano? If so, for how many years? ___

10 Have you had private lessons on some other instrument? If so, what instrument? ______________________

11 How long? ________________ years.

12 List any other instruments you have learned to play. ________________

____

13 How many years have you played in a school orchestra?___School band?____

In a community or church orchestra?___

In a community band? __________years.

14 How many years have you sung in a school chorus? ____ Church choir? ____

In a community chorus? ________years.

15 Have you ever had private lessons in singing (voice)? If so, for how many years? ______

16 Are you now a member of a school chorus? ( ) Yes ( ) No

School orchestra? ( ) Yes ( ) No

School band? ( ) Yes ( ) No

17 Check which of these instruments you have in your home. ( ) Piano

( ) Accordion ( ) Electronic Organ

18 ( ) Guitar ( ) Violin ( ) Cello

19 ( ) Flute ( ) Clarinet ( ) Sax

( ) Trumpet ( ) Trombone ( ) Drum

20 ( ) Radio ( ) Record Player

21 ( ) F-M Radio

( ) Other instruments (please name)

____

22 How many persons in your family, not including yourself, play piano? ______

Play other instruments? ____________

23 Do members of your family play or sing together in your home?

( ) Never

( ) Seldom

( ) Occasionally

( ) Frequently

24 How well do you sing? (Check one)
( ) Can't carry a tune
( ) Can just carry a tune
( ) Can sing along when others sing
( ) Can carry a tune by myself
( ) Able to sing solos for small audiences or friends
( ) Able to sing solos for large audiences

(Check or two)
25 How well do you play an instrument?
( ) Not at all
( ) Can pick out a tune on one
( ) Can play simple music
( ) Can play moderately difficult music
( ) Can play very difficult music
( ) Can play in recitals or concerts
( ) I have played professionally

26 How often do you attend musical events such as concerts or operas?
( ) Never
( ) Occasionally, when convenient
( ) Frequently, very often
( ) On every possible occasion

27 How musical do you think you are?
( ) very much below average
( ) a little below average
( ) average
( ) a little above average
( ) very much above average

28 What kind of music do you enjoy? In each of the five groups below check two kinds. Check the two kinds in each group that you would most want to sit and listen to.
1) ( ) Symphony orchestra
( ) Military band (marches)
( ) Concert band
( ) Dixieland Jazz band

2) ( ) Folk songs
( ) Operatic arias
( ) Gospel songs
( ) Leider (art songs)

3) ( ) Chamber music
( ) Concertos
( ) Latin American dance music
( ) Square dance music

4) ( ) Western music (cowboy)
( ) Rock and roll
( ) Ballet music
( ) Concert piano

5) ( ) "Country" music
( ) Selections from operas
( ) Selections from musical shows
( ) Blues songs

Name ______________________

INDIANA-OREGON MUSIC DISCRIMINATION TEST

by Kate Hevner Mueller
revised by Newell H. Long

No = no difference between A and B

R = Rhythm changed

H = Harmony changed

M = Melody changed

Ex. 1.	A	B	No	R	H	M
Ex. 2.	A	B	No	R	H	M
Ex. 3.	A	B	No	R	H	M
	A	B	[✓ No]	R	H	M
1.	A	B	No	R	H	M
2.	A	B	No	R	H	M
3.	A	B	No	R	H	M
4.	A	B	No	R	H	M
5.	A	B	No	R	H	M
6.	A	B	No	R	H	M
7.	A	B	No	R		
8.	A					

21.	A	B	No	R	H	M
22.	A	B	No	R	H	M
23.	A	B	No	R	H	M
24.	A	B	No	R	H	M
25.	A	B	No	R	H	M
26.	A	B	No	R	H	M
27.	A	B	No	R	H	M
28.	A	B	No	R	H	M
29.	A	B	No	R	H	M
30.	A	B	No	R	H	M
31.	A	B	No	R	H	
32.	A	B	No			
33.	A					

APPENDIX B

COOPERATING SCHOOLS AND COLLEGES

Names of persons who made arrangements in the various schools and colleges for the testing are in parentheses.

Alabama

Stillman College (Richard Turner)
Druid High School, Tuscaloosa (Richard Turner, Ernest Reynolds, Mrs. Mary McDonald)

Arkansas

Arkansas State College, State College (Donald R. Minx)
Mountain Home High School (Gerald Reed, Jerry Morris)

Illinois

Arcola Community High School (Harold Scott, Joel Klein)

Indiana

- Bloomington Metropolitan Schools
  - Broadview Elementary School (Pauline Webb)
  - Binford Junior High School (Mrs. Dorothy Taraba)
  - Dyer Junior High School (David McIntosh)
- University School, Bloomington (Roberta Kauffman)
- Frankfort Public Schools (Aden K. Long)
  - Riley Elementary School (Dorsey Pitman)
  - Frankfort High School (Aden K. Long, Chris Schwabe)
- Indianapolis Public Schools (Edward L. Emory)
  - Broadripple High School (Gene Poston)
  - School No. 56 (Grace L. Vaughn)
  - School No. 88 (Carolyn Jourdan)
- Lawrence Elementary School, Indianapolis (Mrs. Judith Kerkhove)
- Lawrence Township Junior High School, Indianapolis (Garrett Grant)
- Martinsville Junior High School (Milton Stewart, Stephen K. Smith)
- DePauw University, Greencastle (Dr. Milton Trusler, Dan Hanna)
- Indiana State University, Terre Haute (Dr. James Barnes, Dr. Victor Danek, Grant Newman)
- Indiana University, Bloomington (Dorothy Kelley, Miriam Gelvin)

Louisiana

Bolton High School, Alexandria (James Clark)
Joseph S. Clark High School, New Orleans (Albertha Edwards)
John F. Kennedy High School, New Orleans (Emile Robichaux) (Dr. Alma Peterson)

Michigan

Detroit Public Schools (Robert H. Klotman)
  Cooper School (Juanita Anderson)
  Nolan School (Ronald Brown)
  Wayne School (V. Margaret Millard)
  Franklin School (Marjorie Gruner)
  Courville School (Lydia Krivanek)
  Eastern High School (Jerome Stasson)
  Cass Technical High School (Harold Arnolde, Marilyn Jones)
University School, Ann Arbor (Charles Keen)
University of Michigan, Ann Arbor (Marguerite Hood)

Oklahoma

Oklahoma City Public Schools (Edwin Keller)
  Capital Hill Junior High School
  Eisenhauer Junior High School (Ralph Enz)
  Northwest High School
Oklahoma City University, Oklahoma City
Barnard School, Tulsa (Mrs. Dennis)

Tennessee

Columbia Community High School (Tom Tucker)
Columbia Junior High School (Bill Hull)

Texas

Denton Public Schools (Carroll McMath)
  Newton Razor School
  Denton Junior High School (Norman Lang)
  Denton High School (Mrs. Russell)
North Texas State University, Denton (Dr. Kenneth Cuthbert)

Virginia

Virginia Beach Junior High School (Eugene Utley)

England

Buckhurst Hill County High School, Chitwell, Essex (John Rippin)
Maiden Erleigh Secondary School, Reading, Berk. (J. G. Dunkley)
Leeds Grammar School, Leeds (Anthony Cooke)
King's College Grammar School, Wimbledon, Surrey (Noel G. Long)
Wargrage Secondary School, near Reading, Berk. (A. W. Waghorn)
Chell Secondary School, Stevenage (Maureen Sedgewick)
University of Leeds, Leeds (Dr. James Denny)
West Ham College of Technology (Rosamund Shuter)
Froebel Institute College of Education, London (Desmond Sergeant)
Bulmeshe College of Education, Reading, Berk. (J. M. Morris)
Fairfield Grammar School, Montpelier, Bristol (Barry Simms)

Scotland

Leith Academy Elementary School, Edinburgh
Leith Academy, Edinburgh (Miss Puntis)
Ainslie Park Secondary School, Edinburgh (Mr. McIntosh)
Graine High School, Falkirk, Stirlingshire (Mr. Whitelaw)
Annon Academy, Annon (Mr. Sewell, Miss Willis)
College of Education, Falkirk (Dr. E. E. Thomas)

Wales

Girls Grammar School, Pontypool, Monmouthshire (Jean Adams)
Newport Public Schools, Mon. (Ronald Cleak)
  Duffryn Junior High School (Dr. Powell, Miss Painter)
  Hartridge High School (H. G. Leonard)
Llantilio Festival Choir, Abergevanny, Mon. (Jean Adams)

APPENDIX C

TABLE XXX. NORMS FOR COMPLETE 43-ITEM TEST - TEST S

Test score	Centiles by Ages All subjects (USA & GB)								
	11	12	13	14	15-16	17-18	19-21	22-25	26---
12		1							
14									
16		2	1						1
18	3			1	1				
20		3							2
22		7	3		2	1			
24	6	13	5	2	3				
26	15	19	10	4	4	2	1		3
28	22	27	16	7	7	4	2		
30	31	30	21	9	10	6	3		
32	46	38	27	15	15	8	5	4	4
34	50	47	31	21	19	12	7	6	6
36	62	57	40	27	25	17	10	9	9
38	75	69	50	37	31	22	13	15	11
40	84	76	60	47	38	29	16	17	13
42	90	84	68	59	48	36	19	21	16
44	96	89	75	63	58	42	24	23	21
46	99	92	79	75	65	48	28	27	25
48		94	83	81	72	55	34	33	27
50		97	86	86	81	62	41	34	
52			90	88	86	68	47	41	35
54		98	93	91	89	74	57	47	44
56			95	94	93	80	65	53	48
58			97	97	95	84	72	59	57
60		99	98	98	96	89	78	64	62
62			99	99	97	92	84	71	68
64					98	95	89	73	73
66						96	92	82	79
68					99	98	94	86	86
70							97	91	88
72						99	98	96	95
74							99	99	99
Number tested	32	128	165	152	538	641	499	79	88
Range	30	54	51	51	62	61	65	44	58
Mean score	33.8	34.1	38.4	40.7	42.1	46.4	51.3	54.0	54.7
S. D.	7.1	8.6	9.7	8.7	9.6	10.6	10.7	12.0	12.6
Standard error of the mean	1.25	0.76	0.75	0.70	0.42	0.42	0.48	1.34	1.34

TABLE XXX. NORMS FOR COMPLETE 43-ITEM TEST - TEST S (cont.)

Test score	Centiles by Grades (or Forms) All subjects								
	6 (1)	7 (2)	8-9 (3-4)	10-12 (5-6)	Adult	College non-music	Post-grad.	College music majors	Post-grad. music
10	1								
12		1							
14									
16	2								
18		2							
20	3	3		1		1		1	
22	4	7	1						
24	10	12	2	2			3		
26	20	17	4	4					
28	27	26	8	6		2	5		
30	34	33	10	8		4			
32	44	41	14	12		7	8		
34	51	47	19	16	5	9	10		
36	65	56	27	22		13	18		
38	77	67	36	29		19	21		
40	85	74	47	36		24	23	2	
42	89	84	58	45		28	29	3	
44	93	88	66	53		34	37	4	
46	96	91	72	61		40	44	7	
48	98	95	77	68		48	47	11	
50	99	98	82	76	12	56	52	14	
52			87	82	17	63	68	20	
54			91	85	41	72	71	28	3
56			93	90	47	80		37	6
58		99	96	92	58	85	84	48	14
60			98	95		89	89	58	20
62			99	96	70	92	94	70	25
64				97	82	95		76	31
66				98		97	97	85	43
68				99	94	98	98	91	57
70					99	99		94	68
72								97	83
74								99	98
76									99
Number tested	70	170	329	882	17	500	38	272	35
Range	43	50	43	62	39	60	49	58	21
Mean score	33.0	34.2	41.2	43.4	57.1	47.8	47.5	58.0	66.3
S. D.	7.7	8.5	8.8	9.9	8.9	10.3	11.0	7.9	5.8
Standard error of the mean	0.92	0.65	0.49	0.33	2.17	0.46	1.79	0.48	0.99

TABLE XXXI. NORMS FOR THE 37-ITEM TEST - TEST J

Centiles by Ages					Test score	Centiles by Grades		
11	12	13	14	15-16		6 (1)	7 (2)	8-9 (3-4)*
1					8			
					10		1	
3					12	1		
5		1		1	14	2		
6	1		1		16	3	2	1
8	2	2			18	4		
9	3	3	2	2	20	6	3	2
17	6	5	3	4	22	11	5	3
26	10	9	5	10	24	21	9	6
44	14	14	11	15	26	33	13	12
54	20	17	17	17	28	43	17	16
65	32	27	24	21	30	56	28	22
73	41	35	32	28	32	64	39	29
84	52	46	41	45	34	71	49	40
90	61	58	53	59	36	77	60	52
96	71	68	64	66	38	83	70	63
	77	75	74	75	40	87	76	73
	85	81	81	81	42	93	83	80
98	90	86	87	89	44	95	88	85
	95	90	92	92	46	96	93	90
		95	95	95	48	98	96	93
	98	96	97	96	50			96
99		98	98	97	52	99		
				98	54		99	98
	99	99	99	99	56			99
64	268	384	308	81	Number tested	124	489	492
45	49	48	48	42	Range	41	52	48
27.5	33.9	34.8	35.3	35.2	Mean score	30.1	34.2	35.7
7.1	7.6	8.0	7.7	7.8	S. D.	7.7	7.9	7.8
0.89	0.47	0.41	0.44	0.86	Std. error of the mean	0.69	0.36	0.35

* numerals in parentheses indicate forms, rather than grades for schools in Great Britain